Prestige without Purpose?
Reputation, Differentiation, and Pricing in U.S. Equity Underwriting*

Chitru S. Fernando
University of Oklahoma
307 W. Brooks, Norman, OK 73019
Email: cfernando@ou.edu; Tel: (405) 325-2906

Vladimir A. Gatchev
University of Central Florida
4000 Central Florida Blvd., P.O. Box 161991, Orlando, FL 32816
Email: vgatchev@bus.ucf.edu; Tel: (407) 823-3694

Anthony D. May
Wichita State University
1845 Fairmount St., Box 77, Wichita, KS 67260
Email: anthony.may@wichita.edu; Tel: (316) 978-5509

William L. Megginson[a]
University of Oklahoma
307 W. Brooks, Norman, OK 73019
Email: wmegginson@ou.edu; Tel: (405) 325-2058

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Abstract

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Keywords: Equity underwriting; underwriter reputation; vertical differentiation; underwriting spreads; investment banking; firm-underwriter matching; underwriting syndicates; analyst coverage.

JEL classification: G24, G32, L14, L15

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[a] Corresponding author. Address: 307 W. Brooks, Norman, OK, 73019. Tel: (405) 325-2058. Fax: (405) 325-5491. E-mail: wmegginson@ou.edu.

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1. Introduction

In their well-known study, Chen and Ritter (2000) show that for U.S. IPOs raising between $20 million to $80 million from 1995 to 1998 the gross underwriting spreads are exactly 7%. Despite subsequent media attention and a U.S. Department of Justice investigation into possible underwriter collusion (see Hansen, 2001, for details) this "seven percent solution" continues to persist. Hansen (2001) argues that the 7% contract represents an efficient competitive pricing outcome on the basis of his findings that the 7% spread is not abnormally profitable and the IPO underwriting market is characterized by low concentration and ease of entry. Torstila (2003) also argues against underwriter collusion by showing that clustering of IPO spreads is widespread in many countries and is higher in countries with lower gross spreads. Nonetheless, Abrahamson, Jenkinson, and Jones (2011) reopen the seven percent controversy by reporting that, during the period 1998-2007, the 7% spread has become an even more deeply entrenched feature of U.S. IPOs over time while European fees are around three percentage points lower and have been declining.

This unresolved puzzle is closely tied to another puzzle that lies at the heart of the seven percent controversy. If investment banks can set their fees by collusion, it would seem unnecessary for them to invest in building and maintaining reputation, and besides, the clustering of spreads would seem to suggest that investments in reputation building by investment banks have a negative NPV.[1] Yet, the notion that banks do not or should not invest in reputation building defies reality. For example, in his April 12, 2013 letter to shareholders, Goldman Sachs lead director James J. Schiro stresses that "we continue to be very focused on the reputation of the firm." Indeed, the finance literature has focused extensively on reputation as a metric of underwriter quality, and few would argue against the significant quality differences that are perceived across U.S. underwriters in different reputational classes.[2] Since the U.S. market for underwriting is characterized by vertical differentiation in the services provided by different underwriters, arising from substantive differences in quality and attributes of the services provided, it is essential to take into consideration this differentiated market structure when examining the competitiveness of the U.S. equity underwriting market and the scope for underwriter collusion.

[1] Highlighted by the seminal work of Akerlof (1970), the notion that reputation is valuable to both sellers and buyers provides an important underpinning for a large body of the economics and finance literature. Several authors, including Klein and Leffler (1981), Shapiro (1982), Allen (1984), Diamond (1989, 1991), and Chemmanur and Fulghieri (1994a) advance theoretical models where higher reputation sellers earn reputational benefits by investing in and maintaining their reputation.

[2] Extant studies on the effects of reputational differences across underwriters have been motivated almost exclusively from the perspective of how underwriter reputation is related to IPO underpricing. See, for example, McDonald and Fisher (1972), Logue (1973), Tiniç (1988), Carter and Manaster (1990), Michaely and Shaw (1994), Beatty and Welch (1996), Carter, Dark, and Singh (1998), Dubar (2000), Logue, et al. (2002), Loughran and Ritter (2004), and Hoberg (2007).

In this paper, we make two major contributions to the literature by providing strong new evidence on price and service differentiation in the market for equity underwriting services that helps resolve both the aforementioned puzzles. Modeling the endogeneity of firm-underwriter choice using a two-sided matching approach, we show that high-reputation banks receive average reputational premia equaling 0.65% (0.47%) of average IPO (SEO) underwritten proceeds, which constitutes 10% (13%) of their underwriting spreads. In dollar terms, these average reputation premia amount to $1.15 million per IPO and $1.23 million per SEO. Equity issuers that work with high-reputation underwriters receive significant incremental benefits, including higher offer values, for the reputational premia they pay high-reputation underwriters. And net of reputational premiums, top underwriters charge lower percentage underwriting spreads. Our findings provide the first direct evidence of positive returns to underwriter reputation-building, and strongly contradict continuing suggestions of underwriter collusion in U.S. equity underwriting by showing how the 7% solution can be sustained in a competitive matching-market equilibrium with differentiated pricing and services.

We directly identify underwriter returns attributable to reputation by first studying the relation between underwriter reputation and the dollar spreads associated with underwriting equity offerings. This approach accounts for the possibility that, especially in equity offerings where firm and thus offer values are highly uncertain *ex ante*, measuring underwriter compensation as a percentage of the *ex post* value of the offering and then comparing percentage spreads across offerings does not appropriately capture cross-sectional fee and other differences in issues that are attributable to differences in underwriter reputation.[3] Additionally, underwriters maximize dollar profits, and a reputational premium, if it exists, would be a part of dollar profits. Given that the underwriting spread is the main source of dollar revenue for the underwriter, we focus on the aggregate dollar spread while accounting for factors that affect underwriter costs, such as offer size and risk, and others identified by existing research. We employ three metrics of underwriter returns in equity underwritings derived from Carter (1992), Chemmanur and Fulghieri (1994b), Krishnaswami, Spindt, and Subramaniam (1999), Benveniste, et al. (2003), and Fernando, Gatchev and Spindt (2005): (a) underwriter dollar revenue per underwritten IPO; (b) underwriter dollar revenue per underwritten SEO; and (c) underwriter dollar revenue per underwritten IPO firm over a 10-year period starting at the IPO. Specifically, we examine the association between these return metrics and the Megginson-Weiss and Carter-Manaster measures of underwriter reputation. In our multivariate regression analysis, we control for issue, firm, and market characteristics (such as issue size, firm risk, and prevailing market conditions) that have been shown to significantly affect underwriter costs and risk

[3] These include differences in issue size, risk, cost, and likelihood of repeat offerings. See, for example, Carter and Manaster (1990), Beatty and Welch (1996), Altinkiliç and Hansen (2000), Fernando, Gatchev, and Spindt (2005), and Fang (2005).

exposure and consequently, the spreads charged in equity offerings (Altinkiliç and Hansen, 2000). We model the endogeneity of issuer-underwriter choice using a two-stage estimation procedure that utilizes a two-sided matching model in the first stage based on Sørensen (2007), where both sides exercise choice over the selection of their partners.[4] The second stage of this approach examines how dollar spreads depend on underwriter reputation while accounting for the endogenous choice in the first stage and the effect of the aforementioned non-reputational factors on spreads.

While a casual examination of the raw data shows a strong monotonically increasing relation between underwriter reputation and gross underwriter revenues--for example, the top Megginson-Weiss or Carter-Manaster underwriters earn average and median gross dollar spreads that are eight to ten times larger than those earned by underwriters in the bottom tier--these revenue differences are not adjusted for the effect of endogenous firm-underwriter choice and non-reputational firm, issue, and market factors that also influence underwriter compensation, including issue size. Our regression results clearly show that while part of the higher return is attributable to high-reputation underwriters serving firms that issue more frequently and have larger deals, higher reputation underwriters earn significantly higher compensation even after these size and other effects are accounted for.

For IPOs (SEOs), our baseline regression estimates indicate that a one standard deviation increase in the Megginson-Weiss (MW) ranking corresponds to an increase in the dollar spread of around \$0.30 (\$0.41) million, relative to a mean IPO (SEO) spread of \$5.21 (\$5.56) million (spreads are measured in 2010 dollars). When we alternatively use a set of indicator variables corresponding to MW quintiles, we find that, relative to underwriters in the first (lowest reputation) quintile, underwriters in quintiles three, four, and five earn reputational premiums in IPOs (SEOs) of \$0.22 (\$0.65) million, \$0.28 (\$0.87) million, and \$1.15 (\$1.23) million, respectively. We obtain similar results and arrive at the same overall conclusions when we use the Carter-Manaster ranking to measure underwriter reputation. In addition, our regressions of total revenues earned from IPO clients over a 10-year period (starting at the IPO) on underwriter reputation reveal similar findings: high-reputation underwriters earn significantly higher total revenues from their IPO clients even after controlling for issue and firm characteristics and for the endogenous matching of firms and underwriters.

On a percentage basis (dollar spreads expressed as a percentage of proceeds), our \$1.15 million estimate of the average return to reputation that the most reputable (top MW quintile) underwriters receive relative to their low reputation counterparts (bottom MW quintile) in IPOs translates to approximately 0.65% of their average IPO proceeds, which is an economically significant part of the

[4]Sørensen (2007) develops a framework for Bayesian estimation using Gibbs sampling of the two-sided matching model developed by Gale and Shapley (1962) and Roth and Sotomayor (1989).

roughly 6.3% average gross spread garnered by top banks relative to their average IPO proceeds. For SEOs, our findings are similar. Banks in the highest MW quintile receive around $1.23 million more in underwriter spreads than banks in the lowest MW quintile. On a percentage basis, this relative premium amounts to 0.47% of top banks' average SEO proceeds, which again is economically significant considering that their average gross spreads amount to roughly 3.6% of their average SEO proceeds. We conclude that reputable underwriters earn an economically and statistically significant reputational premium for their services in IPOs and SEOs, which is consistent with a competitive market for underwriter services that clears on reputation.

Our second set of findings in support of a competitive market in underwriter services that clears on reputation documents the incremental benefits issuing firms receive from high-reputation underwriters in return for paying reputational premiums as part of their fees. This analysis complements the work of Liu and Ritter (2011) on the question of why issuers tolerate higher underpricing by some underwriters. They propose and find evidence for the hypothesis that equity issuing firms which value analyst coverage the most--those with venture capital backing--allow investment banks to underprice their IPOs more in order to gain research coverage from these banks' all-star analysts after the offering. Before examining non-price attributes, including all-star analyst coverage, that may differentiate high- and low-reputation underwriters, we first examine how high-reputation underwriters affect the valuation of IPOs and SEOs. Both in IPOs and SEOs, we show that issuing firms obtain higher valuations when the reputation of their lead underwriter is relatively higher. Consequently, even if issuing firms that work with high-reputation underwriters might experience higher underpricing *ex post*, especially in more recent offerings, our findings show that these issuers tangibly benefit by receiving higher proceeds from their offerings relative to otherwise identical firms that work with low-reputation underwriters.[5] Additionally, as in Liu and Ritter (2011) for underpricing, we show that high-reputation underwriters earn their reputational premiums by providing issuing firms considerable non-price benefits, including all-star coverage and larger and more reputed syndicates, which may also explain the valuation benefits to issuers.[6]

While the main focus of this study is on price and service differentiation in equity underwriting that yields returns to underwriter reputation, existing literature has proposed that underwriters in IPOs may also benefit from underpricing. Baron (1982) argues that by increasing underpricing investment banks may reduce their distribution costs for the issue. Loughran and Ritter (2002) suggest that

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[5] See Beatty and Welch (1996), Cooney et al. (2001), and Loughran and Ritter (2004) for discussions of the change in the relation between underpricing and underwriter reputation over time.

[6] Issuing firms' high demand for research coverage by top-rated analysts, and the firms' corresponding willingness to pay for this coverage directly or indirectly, is also examined in Cliff and Denis (2004), Mola and Loughran (2004), Corwin and Schultz (2005), and Clarke, Khorana, Patel, and Rau (2007). Cain and Denis (2013) show that high-reputation investment banks provide more accurate valuations in M&A fairness opinions.

underwriters allocate underpriced shares to investors who generate commission revenues (see also Loughran and Ritter, 2004; Reuter, 2006; Nimalendran, Ritter, and Zhang, 2007). Underwriters may also allocate the shares of underpriced IPOs to company executives (aka "spinning") and benefit by receiving future business from the companies of these executives (Liu and Ritter, 2010). If underwriters benefit from underpricing and underpricing is related to underwriter reputation, then our estimates of underwriter returns to reputation may be biased.[7] We examine whether our estimates for returns to reputation are significantly affected by controlling for IPO underpricing. Accounting for other costs and benefits reflected in the spread, we find that IPO underpricing is generally negatively related to the gross spread. More importantly, we find that even after controlling for IPO underpricing, and thus for the potential benefits that underwriters may receive from it, we still find a significant return to reputation in underwriting spreads.

We also examine the possibility that our findings of a reputation premium are driven by collusion in a segmented equity issue market, where only the top investment banks can underwrite offerings above a certain size, which may facilitate collusion among these banks. First, our findings indicate that the premium earned by top reputation underwriters is similar across IPOs and SEOs, yet percentage spreads in SEO markets do not cluster on a single number and, therefore, collusion is less likely to occur in SEOs. Second, for the reputation premium to be driven by collusion in the top market segment, a necessary (but not sufficient) condition is that an increase in offer size is not accompanied by an offsetting decline in percentage spreads. We note that, the seven percent solution notwithstanding, percentage spreads do in fact decline for the largest of offerings, where segmentation should be most pronounced. And third, we examine the relation between dollar spreads and underwriter reputation while excluding the largest offerings -- IPOs above $200 million and SEOs above $300 million -- and thus using only offerings of sizes frequently underwritten by lower reputation banks. In this restricted sample, where market segmentation is less likely to be a problem, we still observe a premium to underwriter reputation. While the evidence we present does not conclusively rule out collusion in equity underwriting markets, our findings of price differentiation through reputation premiums and service differentiation through higher-value services being provided by high-reputation underwriters are not the typical outcomes of a collusive market.

While the quality certification role that reputable intermediaries might play in financial markets has been shown theoretically by Titman and Trueman (1986), Diamond (1989, 1991), Rajan (1992), and Chemmanur and Fulghieiri (1994a), our findings provide the first explicit evidence of high-reputation

[7] Existing literature finds that underwriter reputation is negatively related to underpricing in the 1980s and positively related to underpricing in subsequent periods.

underwriters in equity markets earning reputational premiums relative to low-reputation underwriters large enough to warrant making significant investments in reputation building.[8] While a positive relation between reputation and returns is often assumed in a variety of markets, few empirical studies have attempted to quantify these returns or calculate the value of a strong reputation.[9] In cases where existing literature has examined underwriter benefits to reputation in equity issuance, the focus has been mostly on the negative effect of reputation loss on underwriter market share. For example, Smith (1992) finds that Salomon Brothers experienced a significant loss in underwriting market share following its 1991 bond trading scandal. Similarly, Beatty, Bunsis, and Hand (1998) provide indirect evidence on the value of underwriter reputation by finding that underwriters who are subject to SEC investigations experience large declines in IPO market share, which they attribute to loss of reputational capital. Additionally, Hanley and Hoberg (2012) find that underwriters who have high exposure to litigation risk experience economically large penalties that include the loss of market share. Further support for the idea that underwriters have reputational incentives to minimize underpricing is provided by findings that excessive IPO underpricing leads to a loss in market share for the underwriter (Beatty and Ritter, 1986, and Dunbar, 2000), a reduction in the likelihood that the underwriter is employed by the firm in subsequent offerings (James, 1992), and a decrease in the lead underwriter's market value (Nanda and Yun, 1997).[10] Our study complements this literature by documenting and quantifying the significant returns that investment banks earn on their reputational capital by underwriting equity issues.

The remainder of the paper is organized as follows. Section 2 discusses the relevant literature to provide context and motivation for our empirical analysis. Section 3 discusses our data and methodology. Section 4 reports the findings from our empirical analysis of returns to reputational capital, while Section 5 presents our analysis of the benefits reputable banks provide to issuers. Section 6 presents the results of

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[8] Brau and Fawcett (2006) find that CFOs view the use of a top investment banker as one of the most important positive signals of value in the IPO process, second only to strong historical earnings.

[9] An exception is the recent literature studying the returns that participants in online auctions generate by enhancing their reputation, including McDonald and Slawson (2000), Melnik and Alm (2002), Livingston (2005), and Dewally and Ederington (2006). These studies provide evidence that more reputed sellers in online auctions obtain higher compensation because they command higher prices and engender a higher likelihood of a sale.

[10] Outside the equity underwriting context, Fang (2005), Golubov, Petmezas, and Travlos (2012), and Dai, Jo, and Schatzberg (2010) present evidence of premium prices being charged for higher quality services in bond underwriting, merger advisory work, and placement of private investments in public equities, respectively. In a more general context, Karpoff and Lott (1993) and Karpoff, Lee, and Martin (2008) provide extensive evidence of reputational penalties associated with corporate criminal fraud and accounting violations. With respect to financial intermediation, Gopalan, Nanda, and Yerramilli (2011) show that banks which lead arrange syndicate loans to borrowers that subsequently go bankrupt suffer significant reputational penalties after the borrower defaults—particularly if the borrower's bankruptcy occurs unexpectedly or appears to reflect poor monitoring or screening on the lead arranger's part.

our analysis of returns to reputation after accounting for potential benefits that underwriters may receive from underpricing. Section 7 concludes.

2. The Market for Equity Underwriting Services

Economic theory generally predicts a negative relation between quality differentiation and the propensity to collude. Häckner (1994) shows that wide quality differences diminish the incentives for high-quality firms to engage in collusion. Symeonidis (1999) complements the findings of Häckner (1994) by showing that low-quality firms also have less incentive to collude with high-quality firms since the latter incur large costs to attain their higher quality. Symeonidis (1999) and Häckner (1994) further show that the incentives to collude are reduced even more when the costs to establish reputation, and hence the value of reputation, increase. Alternatively, taking collusion as given, Friedman and Thisse (1993) show that collusion diminishes the incentive for firms to differentiate their services by investing in reputation. Consistent with these studies, the U.S. Department of Justice 2010 Merger Guidelines notes that a market typically is more vulnerable to collusion if the products are less differentiated (p. 25), which is not a characteristic of the market for underwriting. Underwriters differ in their ability for price discovery, the quality of the analyst coverage they provide, the access they offer to institutional and retail investors, the quality of their syndicate networks, and the quality of their market making.

The Department of Justice Merger Guidelines also note that when substantial fixed costs are involved in producing a product, high margins can be consistent with incumbent firms earning a competitive return. Therefore, high margins alone, even if they exist,[11] are not evidence of collusion or monopoly power, and have to be examined in conjunction with the investment required to earn and maintain a reputation for high service quality. In addition to requiring large costs, reputation also takes time to build, and both time and costs create significant barriers to entry into the market for equity underwriting. In the context of commercial banking, Vives (1991) observes that "reputation effects in banking may prove to be crucial barriers to entry," noting that all else equal, customers would prefer to do business with high-reputation banks. But Hansen (2001) argues that entry barriers (including those due to lack of reputation) are not significant impediments in the IPO market, noting that banks that do not have the requisite reputation can acquire it by merging with firms that have good reputations. As Hansen also points out, several commercial banks entering the IPO underwriting market in the 1990s have since achieved bulge bracket status, either through acquisitions of reputable investment banks or through investment and organic growth in their own reputations. However, these arguments still beg the question

[11] Chen and Ritter (2000) and Abrahamson, Jenkinson, and Jones (2011) suggest that IPO underwriting margins in the U.S. are too high to be explained by competitive pricing, but Hansen (2001) disagrees.

of how banks obtain a return for their investment in reputation (grown organically or via acquisition) if high- and low-reputation banks do not engage in price differentiation based on reputation. Chen and Ritter (2000) suggest that underwriter reputation may be one reason why underwriters charge high fees but given their argument that fees cluster, this rationale on its own does not explain why low-reputation underwriters also charge the same percentage fees. Chen and Ritter (2000) attribute this clustering to collusion but as argued by Symeonidis (1999), if this were the case, low-reputation underwriters would do better by undercutting the high-reputation underwriters on fees.

Fernando, Gatchev, and Spindt (2005) show that in the presence of underwriter and firm quality differences, the market for underwriting services can operate competitively with high-reputation banks pairing up with high-quality firms and *vice versa*. Such a two-sided market clears on underwriter reputation and firm quality, and not directly on the pricing of underwriter services. Nonetheless, the foregoing discussion suggests that there are two important conditions that must be fulfilled in such a market: (a) price differentiation -- underwriters must receive a return on their investment in building and maintaining reputation, which implies differential pricing in the sense that high-reputation underwriters will receive a higher reputational fee than low-reputation underwriters; and (b) service differentiation -- firms engaging the services of high-reputation underwriters receive higher value than firms engaging the services of low-reputation underwriters. In the rest of the paper, we examine the data for evidence on the existence of these two conditions in the market for equity underwriting services.

3. Data and Methodology

3.1 General Sample

We collect data on securities offerings from the New Issues Database of the Securities Data Company (SDC). We include issues by American firms marketed in the United States from 1980 to 2010. Offerings of closed-end funds, American depositary receipts (ADRs), real estate investment trusts (REITs), unit offerings, and competitive bid offerings are excluded. We also exclude a small number of offerings with missing data on proceeds and/or gross spreads. We use the remaining offerings to compute the market share based reputation measure discussed below. All proceeds exclude overallotment options, and we express all dollar amounts in January 2010 U.S. dollars using the GDP implicit price deflator.[12] In some of our analyses, we also use data on public straight and convertible debt offerings that we collect from SDC.

Our first underwriter reputation measure is based on Megginson and Weiss (1991). For a set of underwriters *I* and for every year *t*, we define the three-year moving average (*t*-3, *t*-2, *t*-1) of IPO and

[12] The GDP implicit price deflator is from the Federal Reserve Economic Data (FRED) database at http://research.stlouisfed.org/fred2/.

SEO proceeds lead-underwritten by underwriter *j* as x_{jt}.[13] Then the Megginson-Weiss ranking for underwriter *j* is equal to:

$$MWR_{jt} = \frac{\ln x_{jt}}{\max_{i \in I}\left[\ln x_{it}\right]} \times 100 \qquad (1)$$

This measure of underwriter reputation is market-share based and is a continuous variable on the interval [0,100]. In year *t*, the underwriter with the highest three-year moving average of IPO and SEO proceeds over the previous three years (*t*-3, *t*-2, *t*-1) would have a Megginson-Weiss ranking of 100. Our definition of this measure is similar to that used by Aggarwal, Krigman, and Womack (2002).[14] Some of the offerings in our sample are lead-underwritten by multiple banks, especially among offerings that occur after 1999, consistent with the findings of Corwin and Schultz (2005). For these offerings, we use the Megginson-Weiss ranking of the lead underwriter with the highest ranking in our empirical analysis. In unreported analyses, we have used the average rank of the lead underwriters with similar results.

Our second measure of underwriter reputation is the Carter-Manaster (CM) ranking, which is based on an underwriter's relative position in IPO tombstone announcements. This measure is developed by Carter and Manaster (1990) and extended by Carter, Dark, and Singh (1998) and Loughran and Ritter (2004). The CM ranking is equal to zero for the lowest reputation underwriters and nine for the highest reputation underwriters. CM rankings are obtained from Jay Ritter's website (http://bear.warrington.ufl.edu/ritter/ipodata.htm). As with the Megginson-Weiss ranking, we use the Carter-Manaster ranking of the lead underwriter with the highest ranking in cases where the offering has multiple lead underwriters.

In many of our analyses, we use indicator variable specifications of the aforementioned reputation rankings. For the Megginson-Weiss ranking, these indicator variables correspond to sample quintiles. For the Carter-Manaster ranking, we group underwriters based on their reputation rank.

3.2 IPO Sample

For the IPO sample, we select only public offerings of common stock that SDC defines as "Original IPOs," common stock that has never traded publicly in any market and the firm offers it for the first time in the U.S. public market. The issue must be defined as common stock in CRSP (share code of 10, 11, or 12) and must be listed on the CRSP daily files no later than 40 trading days after the IPO date. We also require that the firm has accounting data in Compustat from its first annual report after the IPO. To prevent outliers from influencing our results, we eliminate very small and very large offerings--those

[13] For offers with multiple lead underwriters we split the proceeds equally among all lead banks.

[14] Aggarwal, Krigman, and Womack (2002) compute the Megginson-Weiss ranking using the three-year moving average of proceeds over years *t*-2, *t*-1, and *t*, whereas we use years *t*-3, *t*-2, and *t*-1. We do not include proceeds from year *t* in our computation because doing this would induce a mechanical positive correlation between the year *t* reputation ranking and year *t* gross spreads.

with proceeds of less than $5 million or more than $1 billion--which correspond roughly to the 1st and 99th percentile during our sample period. We also exclude a small number of offerings without sufficient data to compute the lead underwriter's Megginson-Weiss and Carter-Manaster reputation rankings. Our final sample consists of 6,378 IPOs. Panel A of Table 1 reports descriptive statistics on offering and firm characteristics for the IPO sample.

3.3 SEO Sample

For the SEO sample, we select issues that are defined as common stock in CRSP and undertaken by firms listed in the daily CRSP files during the 50 trading days prior to the offering. We further require accounting data in Compustat from the most recent fiscal year ending prior to the offering. We exclude very small and very large SEOs--offerings with proceeds less than $5 million or more than $2 billion--to eliminate the influence of outliers. We identify a small number of SEOs misclassified as IPOs by SDC. We correct these misclassifications and include these offerings in our SEO sample. The final SEO sample consists of 9,164 offerings. Panel B of Table 1 reports descriptive statistics for the SEO sample.

**** Insert Table 1 about here ****

3.4 Underwriter Returns

We use three measures of underwriter returns. Our first measure is based on Benveniste, et al. (2003) and Fernando, Gatchev, and Spindt (2005) and is the revenue earned by the underwriter per underwritten IPO as measured by the IPO's gross dollar spread.[15] Our second measure is derived from extending the same idea to SEOs and is, therefore, equal to the gross dollar spread received by the SEO underwriters. The third measure is the revenue per underwritten firm over a 10-year period starting at the IPO, where revenues are measured as the sum of the IPO gross spread and gross spreads from the IPO client's SEOs and public straight and convertible debt offerings earned by the IPO lead underwriter during a 10-year period starting on the IPO date. This measure of underwriter returns combines the findings in Carter (1992), Chemmanur and Fulghieri (1994b), Krishnaswami, Spindt, and Subramaniam (1999), and Fernando, Gatchev and Spindt (2005).

3.5 Regression Methodology

3.5.1 Modeling spreads in IPOs and SEOs

In our multivariate analyses, we control for factors other than underwriter reputation that have been shown to influence underwriter compensation. We model the gross dollar spread in IPOs and SEOs as a function of offering, firm, and market characteristics. Our first control variable is offer size, as larger offerings should entail higher placement costs for the underwriter. As in Corwin and Schultz (2005), we

[15] In additional untabulated tests we examine separately the three components of the gross spread: the management fee, the underwriting fee, and the selling concession. We find that our results are similar across all three components of the spread.

control for the size of IPO offerings using expected proceeds, defined as the midpoint of the original filing price range multiplied by the shares issued in the offering. We use an *ex ante* measure of expected proceeds rather than realized proceeds because theory suggests that *ex post* proceeds are an endogenous function of the underwriter's reputation (Chemmanur and Fulghieri, 1994a; and Booth and Smith, 1986). In the model of Chemmanur and Fulghieri (1994a), high reputation underwriters receive higher compensation per offering because they are able to generate additional value (proceeds) relative to their low reputation counterparts. Thus, including realized proceeds as an explanatory variable would bias estimates of the incremental compensation to underwriter reputation, according to theory. For SEOs, we define expected proceeds (offer size) as the firm's closing split-adjusted price twenty days prior to the offering multiplied by shares issued.

As in Altinkiliç and Hansen (2000), we include as determinants of the spread in SEOs the relative size of the offering (expected proceeds scaled by the pre-issue market value of the issuer's common equity), the standard deviation of the issuer's daily stock returns during a 255 trading day period that ends 20 trading days prior to the offering, and total SEO proceeds in the U.S. market during the three months prior to the offering. Greater relative issue size should increase placement costs for underwriters since more certification is needed to offset rising adverse selection costs (Altinkiliç and Hansen, 2000; Hansen, 2001).

Return volatility may proxy for information asymmetry between investors and the firm's managers, which raises certification and marketing costs (Booth and Smith, 1986; Denis, 1991; Altinkiliç and Hansen, 2000; Hansen, 2001). Greater return volatility may also increase the premium on the underwriter's short put option that would necessitate buying the issuer's shares at the offer price and reselling them at the lesser of the offer price and prevailing market price (Bhagat and Frost, 1986; Hansen and Torregrosa, 1992; Altinkiliç and Hansen, 2000; Hansen, 2001). Total SEO proceeds during the three months prior to the offering serves as a proxy for primary capital market activity, with which underwriters' costs may vary. As argued by Altinkiliç and Hansen (2000), greater financing activity could reflect greater investment opportunities and hence lower adverse selection, which would lower the certification costs of underwriting. Greater levels of financing may also reflect higher investor demand for new issues, which could lower marketing costs due to lower levels of effort required to place the offering. On the other hand, higher demand for underwriting services may put upward pressure on spreads if the underwriting industry is capacity constrained.

As additional determinants of the spread in SEOs, we include the firm's return-on-assets (ROA) as a measure of operating performance, a dummy variable for whether the offering is shelf registered, and the proportion of secondary shares offered. ROA is measured with data from Compustat and is defined as operating income before depreciation scaled by total assets from the firm's last annual report before the offering. Firms with better operating performance may require less certification and lower marketing costs (Burch, Nanda, and Warther, 2005), which would lower the spread. We use SDC to determine which offerings are shelf-registered. Several studies have shown that shelf registration has a negative effect on underwriting spreads and the cost of issuing equity (Kidwell, Marr, and Thompson, 1987; Allen, Lamy, and Thompson, 1990; Denis, 1991; Burch, Nanda, and Warther, 2005). We collect data on the amount of secondary shares in the offering from SDC. Mikkelson, Partch, and Shah (1997) suggest that secondary sales are associated with better timing of IPOs with good earnings prospects. Better timing may lower the spread if it coincides with periods of high investment opportunities, since adverse selection costs may be lower when investment opportunities are high. In addition, Logue and Lindvall (1974) note that more insiders can raise the issuing firm's bargaining power with underwriters, while Dunbar (1995) and Hansen (2001) find that IPO spreads decrease as secondary sales increase. As other determinants of the spread, we include interactions between offer size and the above mentioned explanatory variables because their marginal effects on the underwriter's placement costs may vary with the size of the offering. For example, for a given change in the issuer's return volatility, the marginal impact on the underwriter's total dollar placement cost should be higher at larger offer sizes. Including the interaction between return volatility and offer size allows the impact of return volatility to change with offer size.[16]

For IPOs, we use controls that are analogous to those for SEOs, with the exception that we do not control for shelf registration, since a trivial portion of IPOs are shelf registered. We measure relative issue size in IPOs as expected proceeds scaled by the firm's expected market value of common equity, where the expected market value of equity is defined as the original midpoint of the filing price range multiplied by shares outstanding on the first day that the firm appears in CRSP, up to 40 trading-days after the IPO. We measure the standard deviation of daily returns over a 255 trading day period that starts 41 trading days after the IPO. We measure the firm's ROA with data in Compustat from the firm's first annual report after the IPO. In addition, we use a dummy variable to control for venture capital (VC) backing. As is customary in existing literature, IPO underpricing is measured by the return from the offer price to the first day closing price.

3.5.2 Modeling the Endogenous Issuer-Underwriter Matching

An important drawback of estimating regressions of underwriting spreads on measures of underwriter reputation is that the approach assumes a random matching between issuers and underwriters. However, as suggested by existing theoretical and empirical literature, the matching between issuers and

[16] Altinkiliç and Hansen (2000) model underwriter spreads as consisting of a fixed component and a variable component, where the fixed component is invariant to offer size and the variable component varies with offer size. Our model of underwriter spreads can be interpreted in the same manner, with the fixed component of the spread influenced by the non-interacted explanatory variables and the variable component of the spread influenced by the interactions with offer size.

underwriters is not random. Carter and Manaster (1990) and Beatty and Welch (1996) observe that high quality banks underwrite less risky offerings. Fernando, Gatchev, and Spindt (2005) present a formal theory that predicts positive assortative matching in primary equity markets, and find that reputable underwriters tend to match with larger firms, less risky firms, and firms that are more likely to survive and issue equity in the future. Fang (2005) documents similar empirical findings in primary debt markets. Thus, reputable underwriters may have an incentive to underwrite high quality issues precisely out of concerns over preserving their reputational capital. From the perspective of issuers, observable factors such as firm size and risk, and unobservable factors such as private information known to managers, may influence the firm's decision to seek the services of a reputable underwriter. Likewise, the decision of an underwriter to match with an issuer may be based on observable factors as well as unobservable information known only to the issuer and underwriter. To the extent that these unobservable factors also influence the spread that issuers must pay to float an issue, the regression estimates of the effect of underwriter reputation on spreads will be biased. As described in Heckman (1979), this problem amounts to an omitted variable bias, since the unobserved factors that drive both issuer-underwriter choice and spreads are not explicitly included as right-hand side variables in single-stage OLS regressions. Whether unobservable factors simultaneously influence firm-underwriter matching and underwriter compensation is an open empirical question. *A priori*, adjustments for non-random matching are therefore necessary.

In much of the existing empirical literature, an instrumental variables approach and/or a two-stage approach based on Heckman (1979) are used to adjust for the endogenous matching of firms and intermediaries.[17] For our purposes, these approaches have a significant disadvantage--the first-stage equation should include at least one explanatory variable that does not appear in the second stage equation, and thus is a variable that influences matching without influencing spreads. Empirically, such a variable is difficult to find. To overcome this obstacle, we use a two-stage estimation procedure based on the approach of Sørensen (2007).[18] The first stage of this approach models the two-sided matching of firms and underwriters, while the second stage examines the relation between underwriter compensation and reputation while accounting for the endogenous matching modeled in the first stage. For identification, the model relies on an important implication of positive assortative matching, which is that the characteristics of other underwriters and firms in the market will influence the decision of a given firm and given underwriter to match without influencing the compensation paid to the underwriter by the firm. The characteristics of other players in the market are thus exploited as an exogenous source of variation and used in a manner analogous to that of an instrumental variable. In addition, whereas estimation

[17] See, for example, Dunbar (1995), Fang (2005), Golubov, Petmezas and Travlos (2012), Gande, Puri, and Saunders (1999), Schenone (2004), and Bharath, et al. (2011)

[18] We thank Morten Sørensen for his invaluable guidance and comments on implementing this approach.

procedures based on Heckman (1979) assume a one-sided choice model in the first stage, the Sørensen (2007) approach allows for the estimation of two-sided matching models with sorting, or models in which both sides of the market exercise choice over partners and both sides may be subject to capacity constraints (Gale and Shapley, 1962; Roth and Sotomayor, 1989). In the first stage, we model the two-sided matching of firms and underwriters using Bayesian estimation with Gibbs sampling. From the first-stage estimates, we compute a selection variable, λ, which is included as a control variable in the second stage equation examining underwriter spreads. See Appendix 2 for more details regarding this approach.

4. Empirical Results

4.1 Underwriter Reputation, IPO/SEO Spreads and other Firm Characteristics

In Table 2, we examine how spreads in IPOs and SEOs vary with the reputation of the lead underwriter. In Panel A, we sort samples into quintiles according to the lead underwriter's Megginson-Weiss (MW) ranking and compute mean gross spreads (measured in millions of 2010 dollars) for each quintile.[19] When moving from the first MW quintile (low reputation) to the fifth quintile (high reputation), there is a monotonic increase in mean spreads in both IPOs and SEOs, with an average IPO (SEO) spread of $1.51 ($2.42) million in the first quintile and $11.14 ($9.45) million in the fifth quintile. In Panel B, we sort the samples according to the lead underwriter's Carter-Manaster (CM) rank. Again, we find that spreads tend to increase when moving from the lowest-reputed underwriters (CM ranks of 0-5) to the most reputed underwriters (CM rank of 9), with the former having the lowest average IPO (SEO) spread of $1.46 ($1.81) million and the latter having the highest average spread of $9.96 ($8.16) million.

**** Insert Table 2 about here ****

In Table 2, we also examine the relation between underwriter reputation and total spreads earned from IPO firms during a 10-year period starting on the IPO date. This analysis considers spreads earned by the IPO lead underwriter in public security offerings by the IPO firm during a 10-year period starting on the IPO date, which includes the IPO, subsequent SEOs, and subsequent debt offerings. This sample is restricted to firms that conducted their IPO with a sole-lead underwriter during 1980-2000. In Panel A of Table 2, we find that mean total spreads earned by IPO lead underwriters in public common stock and debt offerings from their IPO clients during a 10-year period are monotonically increasing with the MW quintile. The low-reputation underwriters in the bottom quintile receive, on average, $1.52 million from their IPO clients while the high reputation underwriters in the top quintile receive an average of $13.02

[19] When sorting observations according to the Megginson-Weiss reputation ranking, there are a large number of ties, primarily due to the fact that many underwriters do more than one offering per year, but an underwriter's Megginson-Weiss ranking remains constant within a given calendar year. Tied observations are always included in the same quintile and thus, quintile sizes may differ slightly.

million from their IPO clients over a 10-year period. In Panel B of Table 2, we sort the sample into four groups according to the CM ranking and observe mean total spreads earned from IPO clients over a 10-year period of $1.52 million for underwriters with a CM ranking of five or below and $13.21 million for underwriters with a CM ranking of 9. Moreover, the mean total spreads earned from IPO clients over a 10-year period are monotonically increasing in the CM quartile. Overall, the findings reported in Table 2 indicate that highly reputed underwriters tend to earn larger IPO and SEO spreads as well as larger total revenues from their IPO clients.

4.2 Multivariate Regression Analyses of SEO and IPO Gross Spreads

In this section we examine the returns to reputation in IPOs and SEOs after accounting for the endogeneity of issuer-underwriter matching. Panel A of Table 3 reports coefficient estimates from the first-stage matching equation. The explanatory variables in the first-stage represent characteristics over which agents (firms and underwriters) have certain preferences. We draw from the theory of Fernando, Gatchev, and Spindt (2005) to guide selection of these explanatory variables. In Fernando, et al. (2005), firms and underwriters match in a positive assortative fashion according to issuer quality and underwriter reputation. Firm quality and underwriter reputation are complementary in that the effect of firm quality on the joint surplus (total net value created by the issue) is increasing in reputation, while the effect of reputation on the joint surplus is increasing in firm quality. We thus model the pairing of underwriters and firms as a function of offer size, underwriter reputation, offer size relative to firm size, VC backing in IPOs, and shelf registration in SEOs. We include various interactions of these variables and, in particular, the interaction of reputation and firm size in order to account for complementarities.[20] We do not consider additional variables beyond this parsimonious set because the estimation is computationally intensive, and only parsimonious specifications are feasible.

In Panel A of Table 3, for both IPOs and SEOs we observe a significantly positive coefficient on the interaction of offer size and the MW ranking. The positive coefficients imply that matching is positive assortative so that lower reputation underwriters match with smaller offerings and higher reputation underwriters match with larger offerings. For IPOs, we also find that the coefficient on the interaction of offer size and the VC dummy is significantly positive. This result is also indicative of complementarities across these two characteristics. The coefficients on the remaining explanatory variables are insignificantly different from zero based on the sampling distribution of these coefficients.

**** Insert Table 3 about here ****

[20] The interaction of offer size with underwriter reputation furthermore allows us to identify the signs of the coefficients (see Sørensen, 2007 for the relevant discussion on coefficient identification).

In Panel B of Table 3, we report coefficient estimates from the second stage of our two-stage estimation procedure. For IPOs and SEOs, the dependent variable is the spread. Most of the control variables have the expected influence on IPO and SEO spreads. As expected, spreads are rising with the size of the offering, and the effect of many of the other control variables depends on the size of the offering. For IPOs, the issuer's return volatility has a significantly negative coefficient, although the interaction of volatility with offer size has a significantly positive coefficient.[21] Together they imply that the marginal impact of return volatility on the IPO spread is positive and rising with offer size for offerings larger than $49 million. We also find a significantly negative coefficient on the VC backing dummy, although its interaction with offer size is significantly positive. For SEOs, offer size relative to firm size has a significantly positive effect on the spread, which is consistent with the findings of Altinkiliç and Hansen (2000) that marginal spreads are rising. Shelf registration has a negative impact on the spread, with the magnitude of this effect growing stronger as offer size increases. The coefficient on the volatility of the SEO issuer's stock returns is insignificant, although its interaction with offer size is significantly positive, consistent with a positive impact of volatility on spreads which grows stronger as offering size increases.

In Panel B of Table 3, the coefficient on the selection variable (λ) is statistically insignificant in both the IPO and SEO regressions. The interpretation is that spreads are not significantly correlated with the latent factors that influence the matching between firms and underwriters. This finding is consistent with the notion that firms and underwriters match based on their characteristics (observed or unobserved), while the pricing of underwriting services does not play a significant role at the time of matching.[22]

In Panel B of Table 3, we examine the relationship between the underwriter's MW ranking and spreads in IPOs and SEOs. We find that spreads in IPOs and SEOs increase significantly with the MW ranking of the lead underwriter. For IPOs (SEOs), the coefficient of 0.032 (0.055) implies that a one standard deviation increase in the underwriter's reputation is associated with an approximate $0.30 ($0.41) million increase in the average IPO (SEO) spread.

In Panel C of Table 3, we report coefficient estimates from alternative specifications which include indicator variables that correspond to MW quintiles. These specifications include all the controls from Panel B, but we do not report their coefficients for brevity. The coefficients reported in Panel C of Table 3 represent the incremental increase in the average spread relative to the lowest MW quintile. For both IPOs and SEOs, we find that spreads increase monotonically with the MW quintile. In particular, the

[21] Unless otherwise specified, statements of statistical significance refer to the 5% level.

[22] We should note that *a priori* adjustment for the matching of firms and underwriters is necessary for robustness when examining the relation between underwriter or firm characteristics and outcome variables such as underwriting spreads. Whether such an adjustment is necessary *a posteriori* is an empirical question.

most reputable underwriters in the top quintile earn an average IPO (SEO) spread that is \$1.149 (\$1.227) million higher than the average spread earned by the lowest reputation underwriters in the bottom quintile. Panel A of Figure 1 plots these estimates of incremental underwriter spreads for the different underwriter MW reputation quintiles. From Panel A of Figure 1, we can see that in IPOs, there is an especially sharp (around fourfold) increase in the underwriter reputational premium for underwriters in the highest reputation quintile, highlighting the particular importance and value of underwriter reputation in IPO issuance.

**** Insert Figure 1 about here ****

When we examine Panel A of Table 2, we observe that the average gross spread earned by underwriters in the highest MW quintile are \$11.14 million for IPOs and \$9.45 million for SEOs before controlling for other factors that may influence the spread. Based on our regression estimates in Table 3, roughly 10% (1.149÷11.14) of underwriter spreads in IPOs and 13% (1.227÷9.45) of spreads in SEOs is attributable to the underwriter's reputation and therefore constitutes a return to reputation. The remaining portions of the spreads can be attributed to differences in firm and issue characteristics and especially to the fact that more reputed banks tend to underwrite issues with larger expected proceeds. Panel B of Figure 1 plots the reputation premium as a percentage of the spread conditional on the reputation quintile of the underwriter. In addition, Panel C of Figure 1 plots the dollar spread and the part of the spread that is attributable to returns to reputation. One clear observation from Panel C of Figure 1 is that most of the spread is not attributable to underwriter reputation, but instead is due to the size and corresponding costs of the offering. To provide further perspective, the average IPO spread received by the highest reputation underwriters is around 6.3% of their average IPO proceeds (11.14÷175.87), of which 0.65 percentage points (1.149÷175.87) is a return to reputation. For SEOs, the average gross spread earned by banks in the top MW quintile is approximately 3.6% of their average SEO proceeds (9.45÷260.33), of which 0.47 percentage points (1.227÷260.33) is a return to reputation. Panel D of Figure 1 plots the spread and the reputation premium as a percent of total proceeds. Again we note that a relatively small proportion of IPO and SEO proceeds are due to the reputation of the underwriter, with most of the proceeds determined by the size of the offering. Yet, the part of the spread attributable to underwriter reputation is economically highly significant (\$1.149 million in IPOs and \$1.227 million in SEOs, on average, for the top underwriters) and provides strong incentives to investment banks to invest in reputation.

Panel C of Table 3 also reports second-stage coefficient estimates when we alternatively use the Carter-Manaster (CM) quartile dummies to measure underwriter reputation. The results are consistent with those based on the MW ranking and indicate that there are significant returns to reputation in both IPOs and SEOs. For example, returns to reputation in IPOs and SEOs are monotonically increasing in the CM quartile, with banks possessing the highest CM ranking of nine earning significantly higher compensation in IPOs (SEOs) of around \$0.728 (\$1.178) million relative to banks with CM rankings of five or below. Panel A of Table 2 shows that the average IPO and SEO spreads received by the banks with a Carter-Manaster ranking of nine represents roughly 6.4% of their average proceeds in IPOs (9.96÷156.58) and 3.8% of their average proceeds in SEOs (8.16÷217.31). Our regressions estimates indicate that 0.46 percentage points (0.728÷156.58) of the former and 0.54 percentage points (1.178÷217.31) of the latter can be attributed to reputation.

The findings from the multivariate regression models presented in this section and the accompanying Figure 1 show that a significant part of the higher spreads received by high-reputation underwriters is due to the positive relation between issue size and underwriter reputation. However, even after controlling for issue size and other issue characteristics, we find a statistically and economically significant return to underwriter reputation both from IPOs and from SEOs. Therefore, we find significant evidence of price differentiation in equity underwriting markets, evidence that is consistent with competition among banks of differing qualities.

In untabulated analyses, we have examined whether our conclusions from the regression analyses reported in this section are robust to the inclusion of underwriter fixed effects. We find results that are consistent with those reported. For example, re-estimating the regressions in Panel B of Table 3 while including underwriter fixed effects yields a coefficient estimate on the MW ranking of 0.026 in IPOs and 0.081 in SEOs. Both estimates are statistically significant. These results are consistent with our conclusion that reputation building in equity underwriting is rewarded with higher spreads.

We have also examined the possibility that our findings of a reputation premium are driven by possible collusion on spreads (Chen and Ritter, 2000) or by segmentation in equity issue markets, where only the top investment banks can underwrite offerings above a certain size.[23] As far as collusion is concerned, we note that the premium earned by high reputation underwriters is similar across IPOs and SEOs. Given that collusion on spreads does not seem to occur in SEOs (i.e., percentage spreads do not cluster on a single number), it is unlikely that our findings of a reputation premium are due to collusion. To examine whether the reputation premium is driven by market segmentation based on offer size, we examine the relation between dollar spreads and underwriter reputation while excluding the largest offerings -- IPOs above \$200 million and SEOs above \$300 million -- and thus using only offerings of sizes frequently underwritten by lower reputation banks. In this restricted sample, where market segmentation is less likely to be a problem, we still observe a statistically significant but smaller premium

[23] In this section we only focus on segmentation based on offer size. In the next section we examine market segmentation stemming from the underwriter's ability to provide all-star analyst coverage (Liu and Ritter, 2011).

to underwriter reputation. The smaller premium implies that the marginal returns to underwriter reputation, both for firms and for underwriters, are relatively higher for relatively larger offerings.

4.3 Total Spreads Earned from IPO Clients over a 10-Year Period

In Panels B and C of Table 3, we also report second-stage estimates from models that explain total spreads earned from IPO clients over a 10-year period while accounting for endogenous matching between underwriters and issuers. The dependent variable in the second stage is the sum of the IPO spread and any spreads from subsequent SEOs and public debt offerings that were underwritten by the IPO lead underwriter during the 10-year period following the IPO. We test the effect of underwriter reputation on ten-year revenues earned from IPO clients using the MW ranking (Panel B), MW quintile dummies (Panel C), and CM quartile dummies (Panel C).

Regardless of the specification, we find that ten-year revenues are increasing in underwriter reputation. In Panel B of Table 3, the coefficient on the MW ranking of 0.107 indicates that a one standard deviation (9.28) increase in the MW ranking is associated with an increase in total ten-year revenues from the IPO client of approximately $1 million. Furthermore, relative to underwriters in the lowest quintile of MW reputation (Panel C), underwriters in the highest quintile of MW reputation garner an additional ten-year return of $2.69 million per IPO client. Similarly, the coefficients on the CM ranking dummies reported in Panel C indicate that top underwriters with a CM ranking of nine earn higher ten-year revenues from their IPO clients of $2.62 million relative to banks with CM rankings of five or below. Furthermore, for both the MW quintile dummies and the CM quartile dummies, we find that ten-year revenues earned from IPO firms are monotonically increasing in reputation. These results reveal that higher reputation underwriters earn significantly higher spreads over the long-run from their IPO clients, with the positive returns to reputation especially pronounced for the highest reputation underwriters.

In summary, our findings in this section show that the 7% solution notwithstanding, there are statistically and economically significant differences in the size of dollar spreads and in the composition of percentage spreads earned by underwriters after accounting for endogeneity and other factors that affect underwriter compensation. This evidence points to a high degree of price differentiation based on reputation in the U.S. equity underwriting market, providing the most reputable underwriters substantially higher underwriting spreads as a return on their investment in reputation-building relative to low-reputation underwriters.

5. Benefits for Issuing Firms that Match with High-Reputation Underwriters

The results above clearly show that reputable banks earn large and enduring rents on their reputation capital, and provide strong evidence of price differentiation based on underwriter reputation.

We now examine the benefits derived by equity issuing firms that match with these banks in IPO and SEO offerings, which would warrant the payment of reputational premiums in their underwriting fees.[24] Our analysis complements the work of Liu and Ritter (2011), who examine why issuers tolerate higher underpricing by some underwriters. We first examine how high-reputation underwriters can affect the valuation of IPOs and SEOs. Thereafter, we examine non-price attributes that may differentiate high- and low-reputation underwriters and explain the valuation benefits that issuing firms derive from high-reputation underwriters.

5.1 Valuation Benefits

In this section we examine whether issuing firms receive higher valuations by employing the services of higher reputation underwriters. We use two measures of the value that firms receive at the IPO. The first measure is the natural log of the ratio of the offering price to the original filing midpoint price. As we have argued previously, the original filing price can be viewed as an *ex ante* expectation of the final offer price. Revisions to the filing price reflect, in part, the price discovery and book building efforts of the underwriter. The second valuation variable that we examine in IPOs attempts to measure valuation from the perspective of insiders. For this measure, we use the natural log of the ratio of insiders' realized wealth after the IPO to insiders' expected (at the time of the initial filing) wealth after the IPO, defined as $\ln[(P_M S_R+P_O S_S)\div(P_F(S_R+S_S))]$, where S_R is the number of shares retained by insiders after the IPO, S_S is the number of shares sold by insiders in the IPO, P_M is the market closing price on the first day of trading, and P_O is the IPO offer price. Our measure of insider wealth gains is similar to the ones used by Loughran and Ritter (2002) and Ljungqvist and Wilhelm (2005).[25]

Table 4 reports our analysis of whether IPO firms receive valuation benefits from more reputable underwriters while controlling for the influence of other factors on valuation and endogenous matching between underwriters and firms. In Panel A, we find that the natural log of the ratio of the offer price to the original filing price is significantly and positively related to the MW ranking. Similarly, the MW ranking has a significantly positive effect on insiders' realized wealth immediately after the IPO. In Panel B of Table 4, we report coefficient estimates for our dummy variable specifications of the MW and CM rankings. We find that the positive relation between reputation and valuation documented in Panel A is driven primarily by the superior valuation achieved by the most reputable underwriters in the top MW quintile. For both IPO valuation measures, the indicator variable corresponding to the top MW quintile is

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[24] We thank Jay Ritter for first suggesting that we examine the incremental benefits derived by issuing firms from employing top-ranked underwriters.

[25] Because underwriter reputation is known ex-ante, it is possible that filing prices already reflect (partially or fully) the reputation of the underwriter. In this case, our ability to find a relation between underwriter reputation and valuation would be reduced. Furthermore, even if we find a relation between underwriter reputation and valuation, our estimates are likely to be biased downward and thus should be viewed as a lower bound for the "true" relation.

positive and significant at the 1% level, while the dummies corresponding to the remaining MW quintiles are much smaller and statistically insignificant. Following the standard interpretation of log-linear models, we find that the top MW reputation underwriters, when compared to the rest of the underwriters, provide approximately10% higher offer price and 20% higher insider wealth. We arrive at a similar conclusion when examining the coefficients on the CM quartile dummies in Panel B, as the top underwriters with a CM ranking of nine achieve significantly better valuation outcomes for their IPO issuers relative to underwriters with lower CM rankings.

**** Insert Table 4 about here ****

In Table 4 we use a similar approach to examine how underwriter reputation affects the value firms receive at the SEO stage. Since DeAngelo, DeAngelo, and Stulz (2010) show that most SEO issuing firms would either run out of cash or face severe shortfalls without the proceeds of such an offering, maximizing offering value will usually be a major concern. In this case, our measure of firm value is the natural log of the ratio of the offer price to the firm's stock price on the day before the SEO. We expect that higher reputation underwriters would be able to issue SEOs at lower discounts and thus at higher offer prices relative to the stock price before the SEO. Indeed, our findings in Table 4 indicate this is the case. For example, in Panel A we find that SEO valuation is significantly and positively related to the MW ranking. Our findings in Panel B also indicate that firms engaging underwriters in the top quintile of MW reputation can expect to receive significantly better SEO valuation. Specifically, the coefficient on the top quintile dummy implies that, relative to banks in the lowest quintile, the top banks obtain SEO offer prices which are 1.2% higher, with the difference being statistically significant. For the average SEO, this difference results in additional proceeds of $1.7 million. Given our estimates in Panel C of Table 3, around $1.2 of these additional proceeds is passed on to the top-tier underwriter as a compensation for additional services provided and as a premium to reputation. We arrive at a similar conclusion when using the CM dummy variable specifications to measure the impact of reputation on SEO valuation. Our findings in this section provide strong evidence that issuing firms benefit significantly from higher underwriter reputation. Both in IPOs and SEOs, issuing firms obtain higher valuations when the reputation of their lead underwriter is higher, which points to a high degree of service differentiation based on underwriter reputation.[26]

5.2 Non-Price Attributes of High-Reputation Underwriters

In this section we examine non-price attributes of high-reputation underwriters that may explain the valuation benefits they provide issuing firms. We focus our attention on two underwriter attributes

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[26] These findings parallel the findings for bond underwriting by Fang (2005), who shows that reputable underwriters obtain lower yields and higher net proceeds for issuers. Golubov, Petmezas and Travlos (2012) show that top-tier M&A advisors obtain higher returns for bidding firms.

that existing literature has identified as important from the perspective of issuing firms -- syndicate networks and analyst coverage.

Corwin and Schultz (2005) show that there is a higher likelihood of an IPO price revision in IPOs underwritten by large syndicates and particularly by syndicates with a large number of co-managers, suggesting a higher level of information production within the syndicate. They also show that a larger number of co-managers in the syndicate increases the number of market makers and analysts in the after-market. Overall, their results suggest that issuing firms benefit from increasing the number of syndicate members and especially the number of co-managers. Huang and Zhang (2011) provide evidence that for SEOs the number of managing underwriters (a measure of each SEO's marketing network) is negatively related to the offer price discount, especially for larger offerings. They find a similar result when they use the number of co-managers as a measure of network size.[27]

We expect higher reputation lead underwriters to be more likely to build larger syndicates. Furthermore, because the highest reputation underwriters typically lead the syndicate, we expect higher reputation underwriters to put together more reputed syndicates. As a measure of syndicate size, we use the number of syndicate members. To measure the reputation of the syndicate, we use the average MW reputation rank of all syndicate members, excluding the lead underwriter(s).

Liu and Ritter (2011) present evidence that firms have a preference for all-star analyst coverage and are willing to underprice their IPOs more when all-star analysts associated with the lead underwriter provide coverage after the IPO. Hence, we expect that higher reputation underwriters would be more likely to provide all-star analyst coverage after the IPO. Our measure of all-star analyst coverage comes from Jay Ritter's website and includes IPOs between 1993 and 2009.[28]

Panel A of Table 5 examines how syndicate size, syndicate reputation, and all-star analyst coverage depend on lead underwriter reputation as measured by the lead underwriter's MW ranking. Our estimates clearly show that more reputable underwriters form larger and more reputable syndicates (both in IPOs and SEOs) and are more likely to provide all-star analyst coverage after the IPO. In all models, the coefficient on the MW ranking is significant at the 5% level or better. In summary, our findings in this section provide significant evidence of non-price benefits that high-reputation underwriters bestow on their clients.

**** Insert Table 5 about here ****

[27] The findings of Huang and Zhang (2011) build on the findings of Gao and Ritter (2010) that in SEOs many issuing firms value the marketing efforts of underwriters, as evidenced by their selection of higher cost (in terms of underwriter fees) fully marketed offers over lower cost accelerated offers.

[28] All-star analysts are defined as those that receive the "all-star" designation from Institutional Investor magazine.

5.3 Returns to Reputation after Controlling for Valuation and Non-Price Benefits to Issuing Firms

For our final analysis, we examine the extent to which the returns to reputation received by the most reputable underwriters are due to their ability to achieve better valuations for issuing firms in IPOs and SEOs, to form larger and more reputable syndicates in IPOs and SEOs, and to provide all-star analyst coverage to IPO firms. For that purpose, we re-estimate our models that explain IPO and SEO spreads (Panel C of Table 3) while including our measures of price and non-price benefits to issuing firms as explanatory variables.

When we examined IPO spreads in Panel C of Table 3 we found that the coefficient on the indicator variable corresponding to the top quintile of MW reputation is equal to 1.149. As reported in Table 6, controlling for syndicate size, syndicate reputation, and all-star analyst coverage (services provided) reduces this coefficient to 0.996. When we further control for the ratio of the offer price to the filing price (price discovery), the coefficient reduces even further to 0.712. Controlling further for the ratio of insiders' realized wealth after the IPO to expected wealth (valuation) reduces the coefficient further still to 0.681. These findings suggest that around 41% (or (1.149-0.681)÷1.149)) of the returns to reputation compensate reputable underwriters for the larger and more reputable distribution networks, all-star analyst coverage, and the price discovery and valuation benefits they provide to IPO firms. When we alternatively use the CM ranking to measure underwriter reputation, we arrive at very similar conclusions. The coefficient estimate on the dummy variable corresponding a CM ranking of nine is 0.728 in our original model (Panel C of Table 3). After controlling for all of the above mentioned services and valuation benefits to IPO firms, the coefficient reduce to 0.415 or by 43%. Our findings for SEOs are very similar, with the coefficient on the top MW quintile (CM9) dummy equal to 1.227 (1.178) in our original model from Panel C of Table 3. As reported in Table 6, controlling for syndicate size, syndicate reputation, and SEO valuation reduces this coefficient to 0.653 (0.543) or by around 47% (55%).

**** Insert Table 6 about here ****

Our findings in the previous two sections provide significant evidence of price and non-price benefits that high-reputation underwriters bestow on their clients. These benefits include higher valuations, larger syndicate size, more reputable syndicate members, and all-star analyst coverage. We find that a significant part (41% to 55%) of the larger spreads received by more reputable underwriters is a reward for providing these benefits. Overall, we conclude that there is a significant differentiation in service quality provided by the different underwriters. Such a variation is quality is consistent with the hypothesis that high reputation banks compete for customers by, and are compensated, for providing higher quality services.

6. IPO Underpricing and Returns to Reputation

Underwriters in IPOs may also benefit from underpricing. Higher IPO underpricing may, for example, reduce the costs of placing the issue and/or may result in indirect revenues to the underwriter through soft commissions and through spinning (see Liu and Ritter, 2011 and the references therein). To the extent that underpricing is related to underwriter reputation, it is important to examine whether our returns to reputation estimates from gross spreads are substantially affected by controlling for IPO underpricing. To that end, we include the IPO's initial return as an explanatory variable in our model. Existing literature documents that the relation between underpricing and underwriter reputation has changed over time, from negative in the 1980s to positive in more recent years, we also estimate our model for two sub-periods: 1980-1992 and 1993-2010. The estimated coefficients are reported in Table 7.

**** Insert Table 7 about here ****

We find that in general underpricing is negatively related to gross spreads. This finding may not be surprising because, ceteris paribus, reducing the offer price of an IPO would also reduce the gross spread received by the underwriter. More importantly, we find that even after controlling for underpricing, high reputation underwriters receive a premium through higher gross spreads. When we control for underpricing, the coefficient estimate on underwriter reputation is statistically indistinguishable from the estimate when we do not control for underpricing. While our tests do not shed any light on whether or not high reputation banks extract rents from excessive underpricing, any such rents notwithstanding, high reputation banks receive significant returns to reputation from the gross underwriting spreads.

7. Conclusions

We help resolve the two important puzzles associated with the seven percent solution to pricing U.S. IPO underwriting services by documenting strong evidence of price and service differentiation based on underwriter reputation. We explicitly model and take into account the endogeneity of firm-underwriter choice using a two-sided matching model and show that, both in IPOs and SEOs, higher reputation banks earn underwriting spreads that are significantly larger than the spreads obtained by lower reputation banks, both economically and statistically. Top underwriters earn their reputational premiums by (a) obtaining higher valuations for issuing firms in both IPOs and SEOs and by (b) providing issuing firms considerable non-price benefits, including larger and more reputable syndicates, and all-star analyst coverage. And net of reputational premiums, top underwriters charge lower percentage underwriting spreads. Despite the increased clustering of gross IPO percentage underwriting spreads documented in recent studies, our overall findings uncover significant cross-sectional variation in the structure of underwriter fees, and a corresponding variation in the services received by equity issuing firms. This evidence is strongly supportive of a competitive market in U.S. equity underwriting in the context of two-sided matching and the 7% solution as the equilibrium pricing outcome. And notwithstanding the 7% solution, we provide strong evidence of the returns to underwriter reputation-building in the market for U.S. equity underwriting services.

Price differentiation based on reputation can also help explain the IPO underwriting fee differential between U.S. and European IPOs. Abrahamson, Jenkinson and Jones (2011) ask why U.S. issuers don't demand (lower) European fees for IPOs. This question is somewhat akin to asking why U.S. consumers don't demand the pharmaceutical prices charged by large U.S. manufacturers such as Merck and Pfizer to their European consumers, which are often many times lower than U.S. prices. Despite considerable scrutiny, U.S. regulators have not ruled that this price discrimination is anti-competitive and have even discouraged the re-import of pharmaceuticals back to the U.S. at these lower prices. The rationale for this price discrimination is the notion that pharmaceutical producers must be allowed to recover the large investments they make in R&D, while maximizing market share worldwide to spread costs as widely as possible subject to local price controls, monopsony power and other differences (see, for example, Scherer, 1993, and Malueg and Schwartz, 1994). As noted by Abrahamson, Jenkinson and Jones (2011), IPO market conditions differ significantly between the U.S. and Europe. While an in-depth analysis of these differences is outside the scope of this paper, our findings would suggest that underwriting spread differences observed between the U.S. and Europe for IPOs underwritten by the same U.S. underwriter can at least partially be attributable to the reputation capital of U.S. underwriters being less valuable in Europe than in the U.S. due to the IPO market differences. Additionally, given that the value of reputation is related to the degree of information asymmetry in a market, it may be worthwhile to investigate whether European and U.S. IPO markets are subject to the same *ex ante* level of asymmetric information. It is possible that the higher value of reputation in higher asymmetric information markets may explain the higher U.S. IPO spreads. The findings of Abrahamson, Jenkinson and Jones (2011) that, on average, U.S. IPOs are underpriced by more than European IPOs and the findings of Torstila (2001) that IPO spreads on technology stock oriented exchanges in Europe are comparable to U.S. IPO spreads provide some initial support for this conjecture.

Appendix 1. Variable Definitions

The table describes the variables used in the analysis. SDC provides data on issue proceeds, filing price range, underwriter spreads, secondary shares offered, shelf registration, and syndicate underwriters. The CRSP files provide data on share prices, shares outstanding, and daily returns while the Compustat annual files provide data on total assets, income before depreciation, and common dividends. We obtain investment bank Carter-Manaster rankings between 1980 and 2010 and data on all-star analyst coverage from Jay Ritter's website (http://bear.warrington.ufl.edu/ritter/ipodata.htm).

Variable	Definition
Proceeds	Offering proceeds, excluding overallotment options, in millions of 2010 US dollars.
Offer size	Midpoint of the original filing price range times shares issued in the offering, expressed in millions of 2010 US dollars.
Spread	Total gross spread of the offering, in millions of 2010 US dollars.
MW ranking	The Megginson-Weiss ranking of the offering's highest ranked lead underwriter. Rankings are based on each bank's underwritten proceeds for the past three years. See Equation (1) in the paper.
CM ranking	Carter-Manaster ranking of the offering's highest ranked lead underwriter.
VC backing dummy	Equals one if the IPO is venture capital backed. Equals zero otherwise
Firm size	For SEOs; share price times shares outstanding twenty trading days before the offering. For IPOs; midpoint of the original filing price range times shares outstanding on the first day with available CRSP data but at most 40 trading days after the IPO. Measured in millions of 2010 US dollars.
Std. dev. of daily returns	For SEOs (IPOs); standard deviation of percentage daily returns during a 255 trading day period that ends (begins) twenty (forty-one) trading days before (after) the offering.
ROA	For SEOs (IPOs); operating income before depreciation divided by total assets from the firm's last (first) annual report before (after) the offering.
Dividend payer dummy	For SEOs (IPOs); equals one if the firm reports a common dividend in its last (first) annual report before (after) the offering. Equals zero otherwise.
Secondary	Secondary shares offered divided by total shares offered.
Shelf dummy	Equals one if the offering was shelf registered and zero otherwise.
Total IPO proceeds for prior 3 months	Total amount of proceeds from all SEOs in SDC during the three months prior to the offering, expressed in hundreds of billions of 2010 US dollars.
Total SEO proceeds for prior 3 months	Total amount of proceeds from all SEOs in SDC during the three months prior to the offering, expressed in hundreds of billions of 2010 US dollars.

Appendix 1 – *Continued*

Variable	Definition
All-star analyst coverage	Equals one if an all-star analyst employed by a lead underwriter initiated coverage of the firm within one year of the IPO. For an IPO in calendar year t, all-star analysts are defined as those that received the "all-star" designation in the October issue of Institutional Investor magazine in year t-1.
Average syndicate reputation	Average Megginson-Weiss ranking of non-lead underwriters in the syndicate.
Syndicate size	For IPOs (SEOs); number of syndicate members for each offering divided by the maximum number of syndicate members over all IPO (SEO) offerings in the sample.
First-day return	The net return from the IPO's offer price to the first-day closing market price.
Stock price in day -2	For SEOs; closing stock price two market days prior to the offering date.
Stock return from day -20 to -2	For SEOs; return on the firm's equity during a period starting 20 market days before the offering date and ending two market days before the offering date.
Nasdaq return during filing period	Return on the Nasdaq Composite Index during a period starting the market day after the filing date and ending the market day before the offer date.

Appendix 2. Estimation Details of the Models of Endogenous Firm-Underwriter Matching

The underwriting spread for each offering i can be described by the following spread equation:

$$Spread_i = X_i'\beta + u_i . \tag{A1}$$

where for offering i, X_i is a vector of determinants that influence the spread. If the spread is observed for all possible pairings of issuing firms and underwriters, then one could obtain unbiased estimates of Equation (A1) using ordinary least squares. However, the underwriting spread is observed only when an issuing firm and an underwriter get together for an offering. An endogenous (i.e., non-random) matching between firms and underwriters may lead to a selection bias when estimating Equation (A1) using only observed spreads, or, as first discussed by Heckman (1979), $E\left(u_i \middle| X_i, \text{ sample selection rule}\right) \neq 0$.

The main approach that we use to incorporate the endogenous matching of firms and underwriters is motivated by the findings of Fernando, Gatchev, and Spindt (2005) that both firms and underwriters exercise choice over partners. Consequently, our approach relies on estimating a two-sided matching model and the methodology we use is based on Sørensen (2007).

Each market consists of a disjoint set of firms I and underwriters J, where each firm can match with one underwriter and each underwriter can underwrite a limited number of firms. Let firm i and underwriter j create a common surplus $\left(V_{ij}\right)$, which is described by the following equation:

$$\frac{V_{ij}}{S_{ij}} = W_{ij}'\alpha + \eta_{ij} , \tag{A2}$$

Where W is a vector of observed characteristics of firms and underwriters and η $\left(\eta \sim N\left(0,1\right)\right)$ contains latent factors--factors that are not observed but that affect the matching outcome. Because the assumption of a homoskedastic η_{ij} is important for obtaining consistent estimates from this latent variable model, the surplus V_{ij} needs to be appropriately scaled. In our setting we use the filing size of the offering as the scale variable. Under the assumption of a fixed sharing rule, which this model makes, firms and underwriters ultimately care about the total surplus so we can restate Equation (A2) as:

$$V_{ij} = S_{ij}W_{ij}'\alpha + S_{ij}\eta_{ij} . \tag{A3}$$

This specification allows the surplus equation to take into account heteroskedasticity of residuals related to the size of the offering. Note that in this approach an offering is denoted by two subscripts, i and j. Under the assumption of a fixed sharing rule (i.e., underwriters receive a fixed proportion of the surplus), the stable outcome in each market is described by the following set of conditions:

$$V_{ij} < \overline{V}_{ij,\forall ij \notin \mu}, \text{ where } \overline{V}_{ij} \equiv \max\left[V_{\mu(j)j}, \min_{j' \in \mu(i)} V_{ij'}\right] \quad \text{(A4)}$$

$$V_{ij} > \underline{V}_{ij,\forall ij \in \mu}, \text{ where } \underline{V}_{ij} \equiv \max\left[\max_{i' \in S(j)} V_{i'j}, \min_{j' \in S(i)} V_{ij'}\right] \text{ and } S(i) \equiv \left\{ j \in J : V_{ij} > V_{\mu(j)j} \right\}.^{29} \quad \text{(A5)}$$

Under the assumption that u_{ij} and η_{ij} follow a bivariate normal distribution with a correlation parameter ρ, the spread of the offering, conditional on the set of observed matching outcomes μ and conditional on $\lambda_{ij} = E\left(S_{ij}\eta_{ij} \,|\mu\right)$, is equal to:

$$Spread_{ij} \,|\mu = X'_{ij}\beta + \rho\sigma_{\varepsilon}\lambda_{ij} + \varepsilon_{ij}. \quad \text{(A6)}$$

We estimate the two equations of the model in two stages. The first stage estimates the surplus equation (A3) conditional on the equilibrium conditions (A4) and (A5) using Bayesian estimation based on Markov Chain Monte Carlo (MCMC) simulation as in Sørensen (2007). The first stage allows us to obtain an estimate of $\lambda_{ij} = E\left(S_{ij}\eta_{ij} \,|\mu\right)$ which we include as a control variable in the second stage equation (A6). As can be seen from conditions (A4) and (A5), in the case of two-sided matching with sorting, matching depends on the characteristics of all other agents in the market. This provides a source of exogenous variation in η and identifies the second stage equation.

[29] The objective of this appendix is to outline the estimation of the two-sided matching model based on Sørensen (2007). For a more detailed discussion of the relevant assumptions and implication of two-sided matching models, see Gale and Shapley (1962), Roth and Sotomayor (1989), Fernando, Gatchev, and Spindt (2005) and Sørensen (2007).

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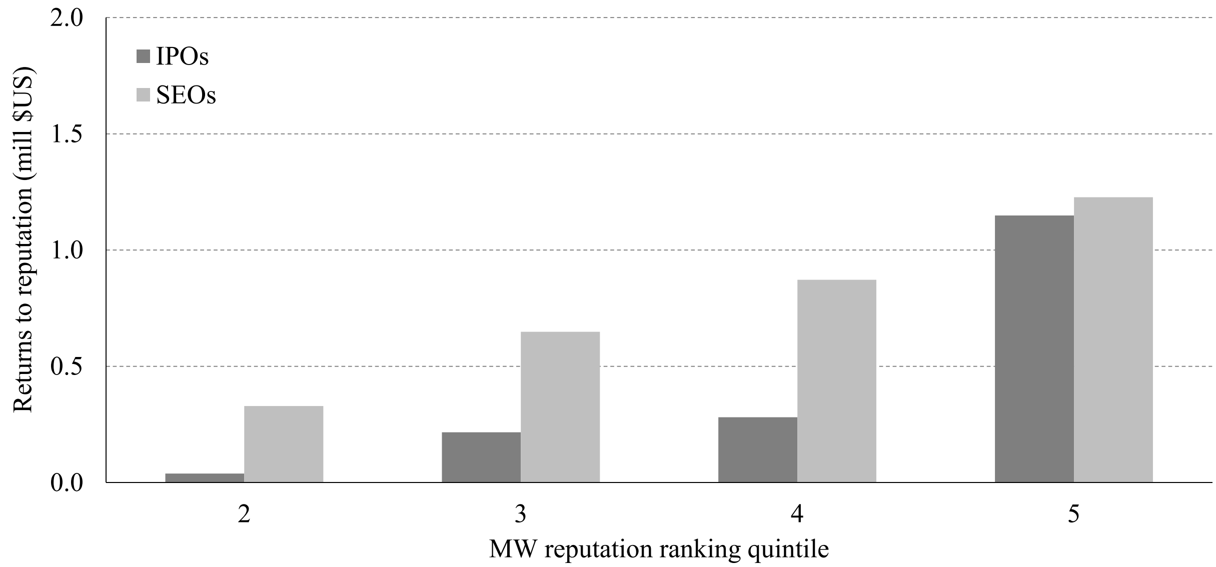
FIGURE 1

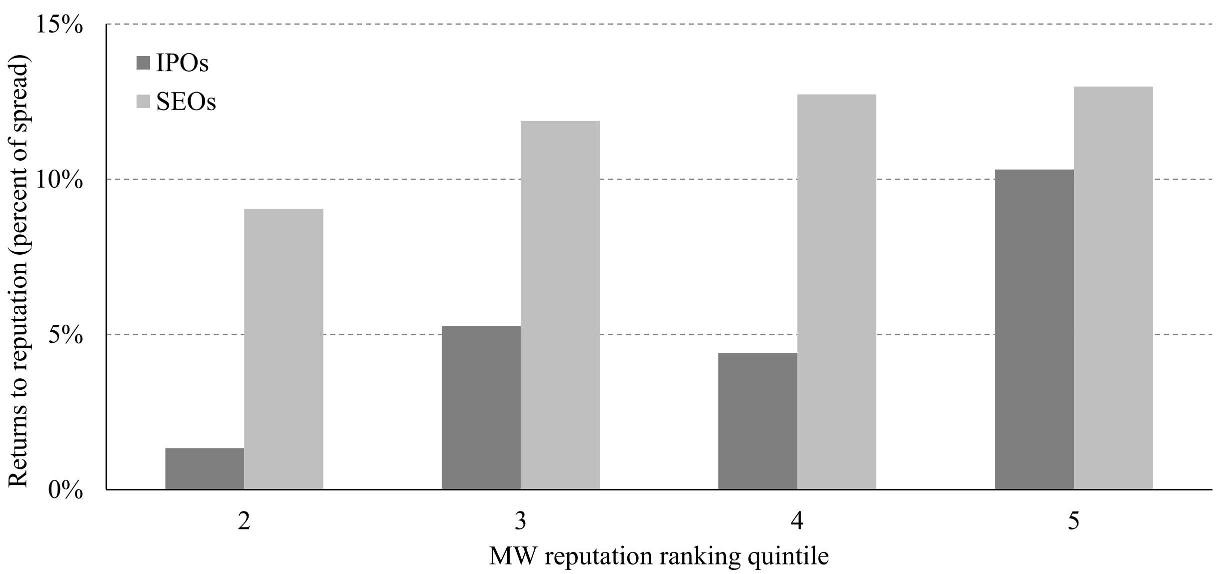
Returns to Reputation after Controlling for Two-Sided Firm-Underwriter Matching

Figure 1 plots estimates of underwriter returns to reputation in IPOs and in SEOs, while controlling for firm, offer, and market characteristics and accounting for firm-underwriter choice using the two-sided matching approach. Underwriter reputation is measured by lead underwriter Megginson-Weiss (MW) reputation ranking quintiles. In Panels A and C, returns to reputation are measured in millions of 2010 US dollars. In Panel B, returns to reputation are measured as a percentage of the total spread. In Panel D, returns to reputation are measured as a percentage of the total issue proceeds. The returns to reputation estimates and their statistical significance are reported in Table 6. For offerings with multiple lead underwriters, we use the reputation of the highest ranked lead underwriter to measure the underwriter reputation of the offering. The reference group (zero returns to reputation) for MW reputation rankings is the first quintile of MW ranking. The sample consists of common stock offerings from SDC with available data in CRSP and Compustat during 1980 and 2010.We exclude unit offerings, ADRs, competitive bid offerings, and offerings by non-US firms, closed-end funds, and REITs.

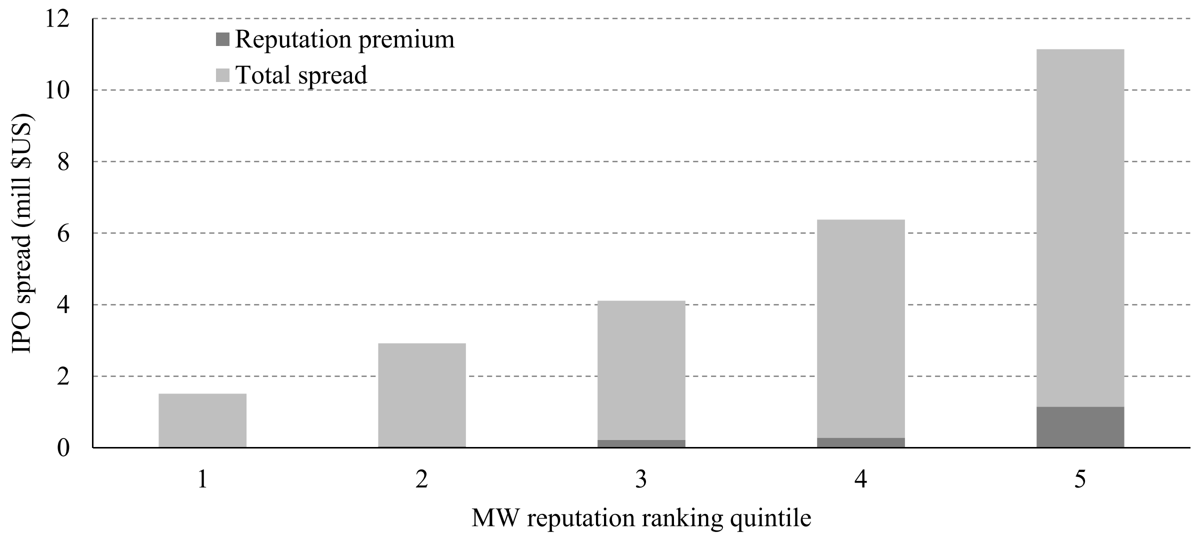
Panel A: Dollar returns to reputation by Megginson-Weiss ranking quintile

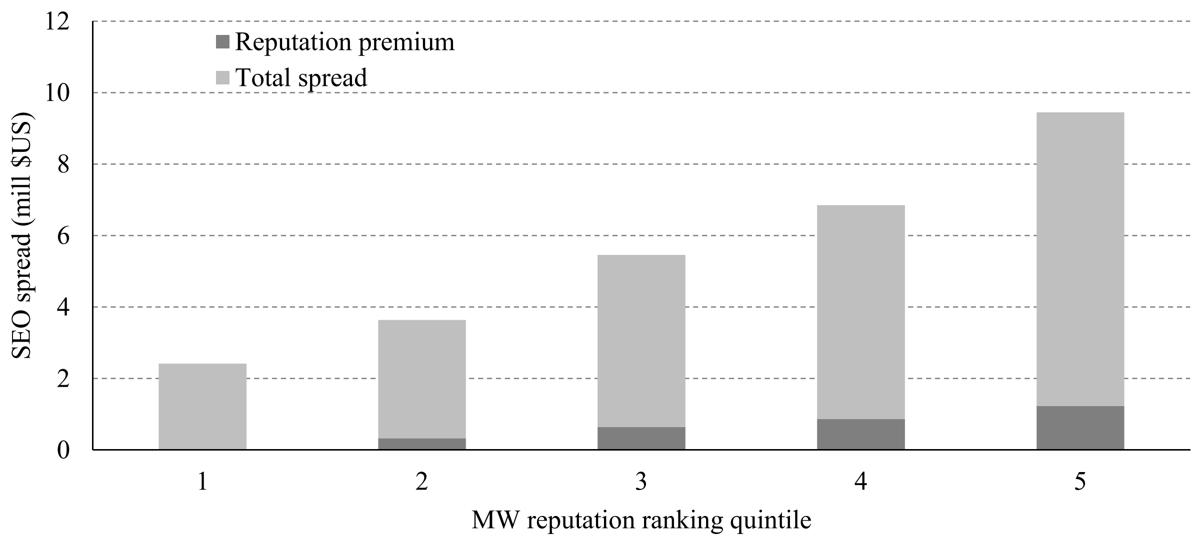


Panel B: Returns to reputation as a percent of total underwriting spread by Megginson-Weiss ranking quintile

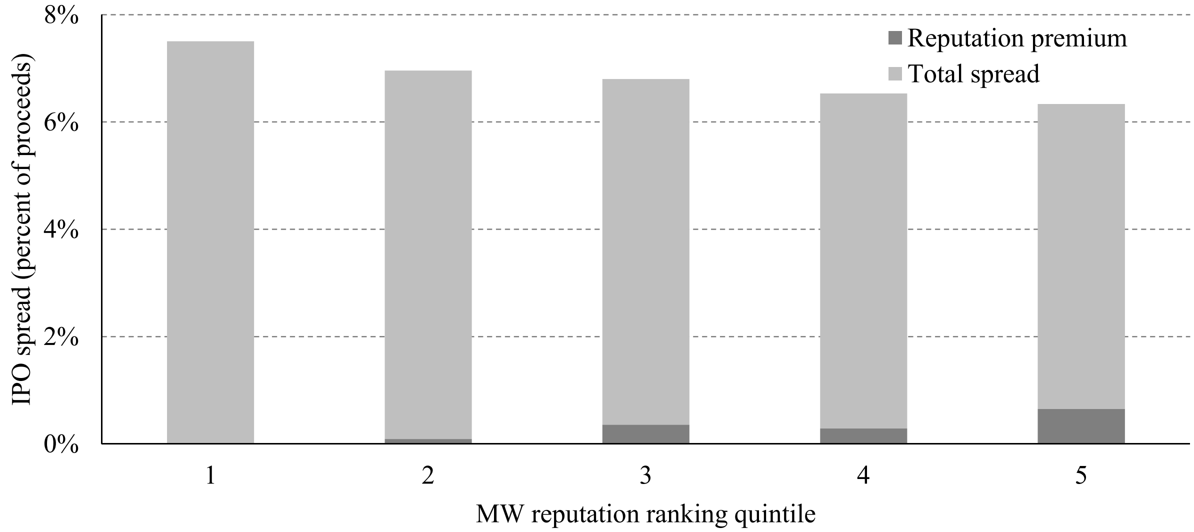


Panel C: IPO and SEO dollar spreads and returns to reputation by Megginson-Weiss ranking quintile





Panel D: IPO and SEO percentage spreads and returns to reputation by Megginson-Weiss ranking quintile



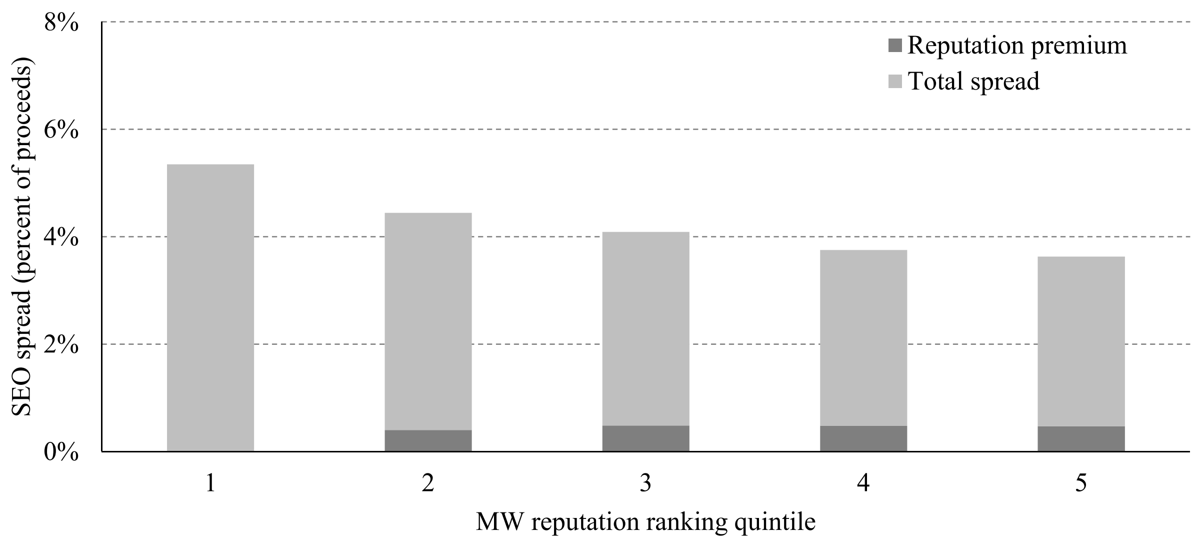


TABLE 1
Descriptive Statistics for Sample IPOs and SEOs

Table 1 reports descriptive statistics for a sample of 6,378 IPOs (Panel A) and a sample of 9,164 SEOs (Panel B). The main sample covers the years between 1980 and 2010 and comes from the New Issues Database of the Securities Data Company (SDC). Unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs are excluded. SDC provides data on issue proceeds, underwriter spreads, secondary shares offered, and shelf registration. In addition, the CRSP daily files provide data on share prices, shares outstanding, and daily returns while the Compustat annual files provide data on total assets, income before depreciation, and common dividends. The computation of the Megginson-Weiss (MW) rankings is described in Section 3.1. We obtain investment bank Carter-Manaster (CM) rankings from Jay Ritter's website. Variables are defined in Appendix 1. Monetary variables are measured in millions of 2010 US dollars.

Variable	Mean	Standard deviation	25th percentile	Median	75th percentile
Panel A: IPOs (6,378 offerings)					
Offering characteristics					
Proceeds (millions of dollars)	79.17	112.98	21.70	43.76	86.76
Offer size (millions of dollars)	78.84	112.75	23.96	44.22	84.56
Spread (millions of dollars)	5.21	6.57	1.58	3.07	6.03
Spread (%)	7.24	0.97	7.00	7.00	7.05
VC backing dummy	0.41	0.49	0.00	0.00	1.00
Secondary (proportion of shares offered)	0.13	0.22	0.00	0.00	0.22
MW Ranking	88.15	9.28	80.65	90.43	96.04
CM Ranking	7.28	2.10	6.25	8.00	9.00
Issuer characteristics					
Firm size (millions of dollars)	286.20	437.67	73.70	148.99	323.11
Std. dev. of daily returns (%)	4.45	2.17	2.92	3.95	5.37
ROA	0.05	0.28	-0.02	0.11	0.19
Dividend payer dummy	0.17	0.38	0.00	0.00	0.00
Panel B: SEOs (9,164 offerings)					
Offering characteristics					
Proceeds (millions of dollars)	140.60	205.17	34.80	73.97	154.80
Offer size (millions of dollars)	146.78	218.85	37.31	76.65	158.59
Spread (millions of dollars)	5.56	6.82	1.76	3.42	6.43
Spread (%)	4.86	1.46	4.00	5.00	5.77
Shelf dummy	0.22	0.42	0.00	0.00	0.00
Secondary (proportion of shares offered)	0.27	0.39	0.00	0.00	0.50
MW ranking	91.98	7.53	87.48	94.52	98.29
CM ranking	8.04	1.37	8.00	8.83	9.00
Issuer characteristics					
Firm size (millions of dollars)	1,601.08	6,281.32	187.65	487.27	1,303.34
Std. dev. of daily returns (%)	3.35	1.82	2.14	2.98	4.07
ROA	0.07	0.25	0.04	0.11	0.18
Dividend payer dummy	0.38	0.49	0.00	0.00	1.00

TABLE 2
Underwriter Reputation and Gross Spreads Earned in IPOs, SEOs, and from IPO Firms over a 10-Year Period

This table reports mean gross spreads and proceeds in millions of 2010 US dollars for IPOs and SEOs by lead underwriter Megginson-Weiss (MW) reputation ranking quintiles (Panel A) and by Carter-Manaster (CM) reputation rankings (Panel B). The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. The table also reports, by MW quintile and CM ranking, the mean of the sum of spreads that an IPO lead underwriter earns from an IPO firm over a 10-year period, including the IPO and any subsequent equity and debt offerings. In this case we limit the sample to firms that conducted their IPO with a sole-lead underwriter between 1980 and 2000. To group offerings by Carter-Manaster ranking, we use the integer part of the CM ranking of the underwriter. (e.g., offerings by underwriters with CM of 8.7 are grouped with those by underwriters with CM of 8). For offerings with multiple lead underwriters, we use the reputation of the highest ranked lead underwriter to measure the underwriter reputation of the offering.

	IPOs			SEOs			10 years	
	Mean spread	Mean proceeds	N	Mean spread	Mean proceeds	N	Mean spread	N
Panel A: Mean spreads and proceeds (millions of 2010 US dollars) by Megginson-Weiss raking quintile								
MW ranking quintile								
1	1.51	20.12	1,277	2.42	45.27	1,834	1.52	1,075
2	2.92	41.97	1,277	3.64	81.93	1,838	3.32	1,069
3	4.11	60.43	1,273	5.46	133.53	1,843	5.44	1,075
4	6.38	97.67	1,278	6.85	182.63	1,817	7.90	1,084
5	11.14	175.87	1,273	9.45	260.33	1,832	13.02	1,055
Panel B: Mean spreads and proceeds (millions of 2010 US dollars) by Carter Manaster ranking								
CM ranking								
0-5	1.46	18.89	1,265	1.81	31.26	740	1.52	1,175
6-7	2.65	37.69	1,147	2.62	52.49	1,375	3.28	1,015
8	4.08	60.01	1,897	3.97	94.29	2,753	5.42	1,750
9	9.96	156.58	2,069	8.16	217.31	4,296	13.21	1,418
Below 9	2.93	42.00	4,309	3.26	72.90	4,868	3.71	3,940

TABLE 3
Two-Stage Regression Analysis of Underwriter Reputation and Gross Spreads Earned in IPOs, SEOs, and from IPO Firms over a 10-Year Period

Table 3 reports estimates (*t*-stats in parenthesis) from two-stage models that examine the relation between underwriter reputation and underwriting spreads for IPOs, SEOs, and the 10-year spreads underwriters earn from their IPO clients. The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. Panel A reports estimates from models of two-sided matching between a bank and an issuer for IPOs and for SEOs. Panel B reports coefficient estimates from linear regression models that relate the gross underwriter spread (in millions of 2010 US dollars) to the underwriter's Megginson-Weiss reputation rank while controlling for firm, offer, and market characteristics and accounting for the endogenous matching between issuing firms and underwriters modeled in Panel A. We examine separately IPO spreads, SEO spreads, and the 10-year spreads on equity and debt offerings underwriters earn from their IPO clients. Panel C uses the same control variables as in Panel B while measuring underwriter reputation based on indicator variables conditional on the reputation rank of the underwriter. When reputation is measured by the Megginson-Weiss ranking, we divide the sample into quintiles according to the MW ranking of the lead underwriter: offers with the lowest MW ranking are in the first quintile while offers with the highest MW ranking are in the top quintile. When reputation is measured by the Carter-Manaster ranking, we take a similar approach and divide our sample into four groups: CM ranking between 0 and 5, CM ranking between 6 and 7, CM ranking of 8, and CM ranking of 9. To group offerings by Carter-Manaster ranking, we use the integer part of the CM ranking (e.g., offerings by underwriters with CM of 8.7 are grouped with those by underwriters with CM of 8). For brevity we report only the coefficient estimates for the reputation variables. The reported estimates are the coefficients on indicator variables that correspond to the different reputation groups so that valuation effects are measured relative to the lowest reputation group (MW quintile 1 or CM ranking 0-5).All Panels account for year fixed effects (coefficients not reported for brevity). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests. In Panel A, standard errors are based on the sampled distribution of the coefficient estimates. In Panels B and C, standard errors are corrected for underwriter and year clustering, as well as for the error stemming from the first stage estimation.

Panel A: Modeling two-sided matching of firms and underwriters

	IPOs	SEOs
Offer size	– 15.043***	– 16.536***
	(– 26.60)	(– 27.27)
Offer size × MW ranking	0.157***	0.171***
	(25.72)	(27.41)
Offer size × (offer size / firm size)	– 0.284	– 0.111
	(– 1.24)	(– 0.55)
Offer size × VC backing dummy	0.282***	
	(2.88)	
Offer size × Shelf dummy		– 0.094
		(– 0.71)
Number of observations	6,378	9,164

TABLE 3 – *Continued*

Panel B:Second-stage regressions explaining underwriter spreads in millions of 2010 US dollars

	IPOs	SEOs	10years
MW ranking	0.032***	0.055***	0.107***
	(3.27)	(5.50)	(3.59)
Offer size	0.050***	0.028***	0.105***
	(20.71)	(15.78)	(10.08)
Offer size / firm size	0.232	1.033**	– 0.641
	(0.97)	(2.49)	(– 0.95)
Secondary	0.234	0.185	0.193
	(0.92)	(1.14)	(0.31)
VC backing dummy	– 0.326***		– 0.238
	(– 2.66)		(– 0.78)
Shelf dummy		– 0.258	
		(– 1.43)	
Std. dev. of daily returns	– 0.097***	0.059	– 0.077
	(– 3.56)	(1.21)	(– 1.02)
ROA	0.148	0.237	1.751***
	(1.00)	(1.46)	(3.10)
Total IPO/SEO proceeds for prior 3 months	1.144	0.185	– 5.973***
	(1.43)	(0.17)	(– 4.31)
Offer size × (offer size / firm size)	– 0.001	0.001	– 0.018
	(– 0.17)	(0.67)	(– 1.19)
Offer size × secondary	0.001	– 0.002*	– 0.012
	(0.07)	(– 1.91)	(– 1.05)
Offer size × VC backing dummy	0.005***		0.010
	(3.12)		(1.18)
Offer size × shelf dummy		– 0.004***	
		(– 3.33)	
Offer size × std. dev. of daily returns	0.002***	0.001**	– 0.002**
	(4.00)	(2.33)	(– 2.29)
Offer size × ROA	0.002	– 0.001	– 0.042***
	(0.46)	(– 0.33)	(– 2.86)
Offer size × total IPO/SEO proceeds for prior 3 months	– 0.035***	– 0.005	0.009
	(– 3.72)	(– 0.84)	(0.23)
λ (endogenous matching)	0.001	– 0.001	– 0.006***
	(0.12)	(– 0.40)	(– 2.86)
Adjusted *R*-squared	0.9379	0.8549	0.5258
Number of observations	6,378	9,164	5,358

TABLE 3 – *Continued*

Panel C: Returns to reputation in IPOs, SEOs, and over 10 years in millions of 2010 US dollars

Megginson-Weiss reputation				Carter-Manaster reputation			
MW quintile	IPOs	SEOs	10 years	CM rank	IPOs	SEOs	10 years
2	0.039	0.329^{***}	– 0.080	6-7	0.017	0.326^{***}	0.085
	(0.69)	(4.78)	(0.43)		(0.28)	(3.82)	(0.71)
3	0.217^{**}	0.648^{***}	0.451^{**}	8	0.206^{***}	0.651^{***}	0.452^{***}
	(2.55)	(5.91)	(2.17)		(2.65)	(6.53)	(2.61)
4	0.281^{***}	0.872^{***}	1.590^{***}	9	0.728^{***}	1.178^{***}	2.624^{***}
	(3.10)	(6.91)	(3.31)		(3.60)	(5.53)	(4.04)
5	1.149^{***}	1.227^{***}	2.694^{***}				
	(4.10)	(4.88)	(3.91)				

TABLE 4

Two-Stage Regression Analysis of Underwriter Reputation and Valuation in IPOs and SEOs

Table 4 reports second-stage estimates (*t*-stats in parenthesis) from two-stage models of the relation between underwriter reputation and IPO and SEO valuation while controlling for firm, offer, and market characteristics and accounting for the endogenous matching of firms and underwriters. The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. Panel A reports estimates based on the Megginson-Weiss reputation rank of the underwriter. In specification (1), the dependent variable is the natural logarithm of the IPO offer price relative to the original midpoint of the filing price range. In specification (2), the dependent variable is the natural logarithm of insiders' realized wealth after the IPO relative to filing wealth, defined as $\ln[(P_M S_R + P_O S_S) \div (P_F(S_R+S_S))]$, where S_R is the number of shares retained by insiders after the IPO, S_S is the number of shares sold by insiders in the IPO, P_M is the market closing price on the first day of trading, and P_O is the IPO offer price. In specification (3), SEO valuation is measured by the natural logarithm of the SEO offer price relative to the stock price on the day prior to the SEO. Panel B re-estimates all models using different reputation measures. The reported estimates are the coefficients on indicator variables corresponding to the different reputation groups so that valuation effects are measured relative to the lowest reputation group (MW quintile 1 or CM ranking 0-5). For brevity, Panel B only reports the estimates on the reputation variables. All specifications include year fixed effects and industry fixed effects (coefficients not reported for brevity) based on the 49 Fama-French industries. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests. Standard errors are corrected for underwriter and year clustering, as well as for the error stemming from the first stage estimation.

Panel A: Second stage regression explaining IPO and SEO valuation

Dependent variable	Ln(offer price ÷ file price) [IPOs]	Ln(realized wealth ÷ expected wealth) [IPOs]	Ln(offer price ÷ price at *t*-1) [SEOs]
	(1)	(2)	(3)
MW ranking	0.003**	0.005**	0.001***
	(2.06)	(1.98)	(3.00)
Ln(Offer size)	– 0.025***	– 0.052***	0.004**
	(– 3.17)	(– 3.74)	(2.05)
Offer size / firm size	– 0.044**	– 0.191***	– 0.033***
	(– 2.12)	(– 3.77)	(– 2.98)
Secondary	0.030*	– 0.026	0.003
	(1.94)	(– 0.90)	(0.97)
VC backing dummy	0.016***	0.040**	
	(2.00)	(2.29)	
Shelf dummy			– 0.002
			(– 0.47)
Std. dev. of daily returns	– 0.009***	– 0.005	– 0.006***
	(– 3.27)	(– 1.01)	(– 5.45)
ROA	0.021	0.044	0.002
	(0.83)	(1.32)	(0.21)
Ln(1+Total IPO/SEO proceeds for prior 3 months)	– 0.326*	– 0.506**	– 0.083***
	(– 1.72)	(– 1.96)	(– 10.97)
Ln(1+Nasdaq return during filing period)	0.447***	0.708***	
	(7.24)	(6.63)	
Ln(1+stock return from day -20 to -2)			– 0.016*
			(– 1.92)
Ln(stock price in day -2)			0.006
			(1.21)
λ (endogenous matching)	0.001	0.001	– 0.001***
	(1.17)	(0.75)	(– 6.29)
Adjusted *R*-squared	0.1810	0.2376	0.0936

TABLE 4 – *Continued*

Panel B: Underwriter reputation and firm value

	IPOs		SEOs
	Ln(offer price ÷ file price)	Ln(realized wealth ÷ expected wealth)	Ln(offer price ÷ price at *t*-1)
MW quintile			
2	– 0.001	0.004	0.004
	(– 0.07)	(0.18)	(1.26)
3	0.008	0.023	0.007**
	(0.48)	(0.85)	(2.00)
4	0.017	0.038	0.008*
	(0.95)	(1.06)	(1.78)
5	0.095***	0.195***	0.012***
	(3.01)	(2.93)	(3.04)
CM ranking			
6-7	– 0.003	– 0.010	0.007
	(– 0.68)	(0.42)	(1.50)
8	0.017	0.026	0.011*
	(0.98)	(0.83)	(1.84)
9	0.065**	0.133**	0.011**
	(2.29)	(2.18)	(2.04)

TABLE 5

Syndicate Size, Syndicate Reputation, and All-Star Analyst Coverage

Table 5 reports the second-stage estimates from two-stage models that examine the relation between underwriter reputation and syndicate size, average syndicate reputation (excluding lead underwriters), and all-star analyst coverage. The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. All explanatory variables are defined in Appendix 1. The first stage estimates a two-sided matching model of whether a bank and an issuer match (estimates reported in Panel A of Table 3). The reported coefficients are from linear regression models that explain syndicate size and the average Megginson-Weiss reputation in the syndicate (excluding lead underwriters) and from a probit model of whether or not an IPO firm is subsequently covered by all-star analyst provided by the lead underwriter(s).Syndicate size is measured as the total number of syndicate members for each offering. When an offering has only lead underwriters then the syndicate reputation variable is not available. All-star analyst coverage data comes from Jay Ritter's website and includes only IPOs between 1993 and 2009. All models include year fixed effects.***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests (t-stats in parenthesis). Standard errors are corrected for underwriter and year clustering, as well as for the error stemming from the first stage estimation.

TABLE 5 – *Continued*

	IPO sample			SEO sample	
Dependent variable	Syndicate size	Syndicate reputation	All-star coverage	Syndicate size	Syndicate reputation
Lead MW reputation	0.060**	0.328***	0.091***	0.062***	0.286***
	(2.33)	(8.48)	(4.30)	(5.87)	(10.74)
Offer size	– 0.011	0.009	0.001	0.004***	0.006*
	(– 1.35)	(1.40)	(1.33)	(2.67)	(1.82)
Offersize / firmsize	1.006	– 0.537	– 0.078	0.377	– 2.288***
	(1.47)	(– 0.67)	(– 0.34)	(0.78)	(– 3.12)
Secondary (proportion of shares offered)	– 0.297	– 0.091	– 0.005	– 0.462***	1.020**
	(– 1.40)	(– 0.14)	(– 0.02)	(– 3.90)	(2.30)
VC backed IPO dummy	0.025	0.418	– 0.173		
	(0.21)	(1.18)	(– 2.09)		
Shelf dummy				– 1.181***	1.146**
				(– 4.08)	(2.56)
Std. dev. of daily returns	– 0.148*	– 0.138	– 0.035***	– 0.023	– 0.216*
	(– 1.68)	(– 1.63)	(– 3.26)	(– 0.54)	(– 1.68)
ROA	1.142**	0.877	0.191	0.480**	– 1.216*
	(2.42)	(1.50)	(0.96)	(2.28)	(– 1.74)
Total IPO/SEO proceeds for prior 3 months	– 2.676	4.346*	– 0.136	0.737	1.900
	(– 0.71)	(1.92)	(– 0.18)	(0.93)	(1.51)
Offer size × offer size / firm size	– 0.001	– 0.005	– 0.001	0.002	– 0.001
	(– 0.23)	(– 1.41)	(– 0.69)	(1.13)	(– 0.56)
Offer size × secondary	0.006***	– 0.002	– 0.001	– 0.001	– 0.002
	(2.70)	(– 0.86)	(– 0.98)	(– 0.15)	(– 1.57)
Offer size × VC dummy	– 0.004	0.002	0.001		
	(– 1.30)	(0.76)	(0.78)		
Offer size × shelf dummy				0.001	– 0.002
				(1.00)	(– 1.11)
Offer size ×std. dev. of daily returns	0.002***	– 0.001	– 0.001	– 0.001***	– 0.001
	(2.69)	(– 1.62)	(– 0.34)	(– 5.80)	(– 0.82)
Offer size × ROA	– 0.010	– 0.001	– 0.003*	– 0.002	0.003
	(– 1.58)	(– 0.17)	(– 1.70)	(– 0.84)	(1.08)
Offer size × total IPO/SEO proceeds for prior 3 months	0.029	– 0.040**	– 0.009**	0.001	– 0.008***
	(1.50)	(– 1.96)	(– 2.07)	(0.01)	(– 3.04)
λ (endogenous matching)	0.007	0.008***	0.001	– 0.001	0.003**
	(1.62)	(2.66)	(0.72)	(– 0.10)	(2.01)
Adjusted (Pseudo) *R*-squared	0.6115	0.2954	0.2475	0.3927	0.2692
Number of observations	6,378	4,348	3,322	9,164	6,208

TABLE 6

Returns to Reputation after Accounting for Matching, Services Provided, and Valuation

Table 6 reports estimates of coefficients on indicator variables corresponding to different reputation groupings, where the dependent variable is the gross spread in millions of 2010 dollars. The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. The base model does not account for endogenous matching between firms and underwriters and includes only year fixed effects and reputation indicators as explanatory variables. For the remaining models, we re-estimate the models from Panel C of Table 3 while incrementally accounting for endogenous matching, services provided, and valuation. For brevity, we only report coefficients for the reputation variables. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests (t-stats in parenthesis). Standard errors are corrected for underwriter and year clustering, as well as for the error stemming from the first stage estimation.

	IPOs					SEOs			
		After accounting for:					After accounting for:		
	Base model	Endogenous matching	Services provided	Price discovery	Valuation	Base model	Endogenous matching	Services provided	Valuation
MW quintile									
2	1.183***	0.039	0.008	0.071	0.068	1.463***	0.329***	0.082	0.052
	(5.47)	(0.68)	(0.13)	(1.46)	(1.52)	(7.41)	(4.78)	(0.92)	(0.58)
3	2.377***	0.217**	0.139*	0.200***	0.198***	3.303***	0.648***	0.307**	0.252**
	(10.93)	(2.55)	(1.75)	(3.06)	(3.12)	(16.63)	(5.91)	(2.45)	(2.18)
4	4.432***	0.281***	0.168**	0.235***	0.231***	4.455***	0.872***	0.417***	0.354***
	(20.02)	(3.10)	(2.14)	(4.45)	(3.98)	(22.03)	(6.91)	(3.85)	(3.52)
5	8.232***	1.149***	0.996***	0.712***	0.681***	6.796***	1.227***	0.748***	0.653***
	(35.24)	(4.10)	(3.96)	(7.30)	(7.61)	(34.00)	(4.88)	(4.04)	(3.52)
CM ranking									
6-7	1.045***	0.017	– 0.024	0.042	0.049	0.880***	0.326***	0.058	0.010
	(4.69)	(0.28)	(– 0.47)	(0.71)	(0.79)	(3.23)	(3.82)	(0.68)	(0.12)
8	2.542***	0.206***	0.102	0.149***	0.153**	2.491***	0.651***	0.201*	0.117
	(12.59)	(2.65)	(1.40)	(2.59)	(2.47)	(10.03)	(6.53)	(1.64)	(1.02)
9	7.252***	0.728***	0.546***	0.433***	0.415***	5.681***	1.178***	0.624***	0.534***
	(34.86)	(3.60)	(3.29)	(5.80)	(5.34)	(23.82)	(5.53)	(3.61)	(3.40)

TABLE 7
Underwriter Reputation, Gross Spreads, and Underpricing

Table 7 reports estimates of coefficients from a model, where the dependent variable is the gross spread in millions of 2010 dollars. The sample consists of IPOs and SEOs in SDC between 1980 and 2010 by firms with available data on CRSP and Compustat and excludes unit offerings, ADRs, competitive bid offerings, and offerings by non-U.S. firms, closed-end funds, and REITs. The model accounts for endogenous matching between firms and underwriters and includes year fixed effects (coefficients unreported). As explanatory variables we use firm, issue, and market characteristics as well as measures for services provided and valuation. The model further includes the IPO's first-day return. We estimate the model for the whole sample and for two sub-samples. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels in two-tailed tests (t-stats in parenthesis). Standard errors are corrected for underwriter and year clustering, as well as for the error stemming from the first stage estimation.

	1980-2010		1980-1992		1993-2010	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
MW ranking	0.013***	(4.32)	0.007***	(3.07)	0.017***	(3.67)
First-day return	– 0.641**	(– 2.01)	0.082	(0.33)	– 0.824**	(– 2.14)
Offer size	0.055***	(22.40)	0.050***	(27.35)	0.058***	(17.97)
Offer size / firm size	0.459***	(2.63)	– 0.064	(– 0.48)	0.726***	(3.22)
Secondary	0.192	(1.27)	– 0.066	(– 1.20)	0.415*	(1.86)
VC backing dummy	– 0.136**	(– 2.24)	– 0.064	(– 1.39)	– 0.211**	(– 2.56)
Std. dev. of daily returns	– 0.026	(– 1.70)	– 0.051***	(– 3.43)	– 0.015	(– 0.92)
ROA	0.031	(0.57)	0.135**	(2.13)	0.014	(0.28)
Total IPO/SEO proceeds for prior 3 months	0.768*	(1.88)	0.228	(0.32)	0.807**	(2.10)
Syndicate reputation	0.031***	(9.50)	0.028***	(7.12)	0.037***	(6.75)
Syndicate size	0.007	(1.28)	0.014	(0.82)	0.003	(0.57)
Syndicate size dummy	– 2.609***	(– 8.89)	– 2.396***	(– 7.05)	– 2.937***	(– 6.85)
All-star coverage	0.410***	(5.15)			0.363***	(3.92)
All-star coverage missing	0.161**	(2.07)			0.259	(1.54)
Ln(offer price / file price)	0.138	(0.39)	0.285	(0.79)	0.146	(0.43)
Ln(realized wealth / expected wealth)	0.466	(1.28)	0.104	(0.33)	0.490	(1.24)
λ (endogenous matching)	0.001*	(1.66)	0.001***	(3.37)	0.001	(1.10)
Offer size × (offer size / firm size)	– 0.001	(– 0.57)	0.003	(1.39)	– 0.003	(– 1.22)
Offer size × secondary	– 0.001	(– 0.33)	0.002***	(2.61)	– 0.001	(– 0.46)
Offer size × VC backing dummy	0.002*	(1.65)	0.001	(1.12)	0.002	(1.92)
Offer size × std. dev. of daily returns	0.001***	(2.68)	0.002***	(3.30)	0.001**	(2.17)
Offer size × ROA	– 0.001	(– 0.67)	– 0.006	(– 2.18)	– 0.001	(– 0.39)
Offer size × total IPO/SEO proceeds prior 3 mo.	– 0.007	(– 1.50)	– 0.014**	(– 0.80)	– 0.005	(– 1.04)
Offer size × syndicate reputation	– 0.001***	(– 5.17)	– 0.001***	(– 6.95)	– 0.001***	(– 4.82)
Offer size × syndicate size	0.001	(– 1.01)	– 0.001	(– 0.61)	– 0.001	(– 0.55)
Offer size × syndicate size dummy	0.027***	(5.84)	0.042***	(4.21)	0.024***	(11.87)
Offer size × all-star coverage	– 0.003***	(– 8.90)			– 0.003***	(– 5.83)
Offer size × all-star coverage missing	– 0.003**	(– 1.99)			– 0.003	(– 1.37)
Offer size × ln(offer price / file price)	0.045***	(11.90)	0.053***	(33.28)	0.046***	(16.34)
Offer size × ln(realized wealth / expected wealth)	0.010***	(3.05)	– 0.001	(– 0.43)	0.011***	(2.99)
Adjusted R-squared	0.9881		0.9932		0.9866	
Number of observations	6,378		2,395		3,983	